AMERICAN ARTISAN

JANUARY
1946
DIRECTORY
NUMBER

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

TS200
.A7

AIR CONTROL'S NEW 1946 CATALOG PRESENTING SENSATIONAL NEW LINES of REGISTERS, GRILLES, AIR CONDITIONING UNITS, AND ATTIC FANS

Shown for the first time are many new and outstanding products.

AIR CONDITIONING REGISTERS with new AIR FLOW VALVE—an outstanding improvement in air conditioning registers—knob operated—smartly styled.

GRAVITY REGISTERS with new AIR SEAL INNER FRAME—an improved construction that provides streakproof installations—easier to install—knob operated—removable face.

ATTIC FANS—another new AIRTROL product—provides cooling comfort at low cost.

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And the AIRTROL line of Air Conditioning Units, and Attic Fans.

Write today for your copy of Catalog No. 46 or call your AIR CONTROL Jobber.

AIR CONTROL PRODUCTS, Inc.

Main office -- **COOPERSVILLE, MICHIGAN.**

YOU'LL *Get it Together...* FASTER!

with

Thor **PORTABLE ELECTRIC SCREW DRIVERS and NUT SETTERS**

An accurate, adjustable clutch on this Thor Model ULTW electric screw driver provides positive tension control to set screws to exact tightness.

You can drive screws and nuts at top speed, confident that they will be driven to exact and uniform tightness with complete safety to men, material and fastener when you use Thor Universal Electric Screwdrivers and Nut Setters. With Thor's *complete line* of power units and attachments you can be sure of tools with precisely the right speed, power and control to do your assembly jobs better and quicker.

Whatever the size, type, position or tension requirements of your screw driving and nut setting operations—call today on your nearby Thor electric tool distributor. *Thor engineers serving him—and you—have never failed to solve any such assembly problem yet presented!* They'll be glad to check on *yours* . . . without obligation.

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600 W. Jackson Boulevard, Chicago 6, Illinois
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PHILADELPHIA PITTSBURGH ST. LOUIS SALT LAKE CITY SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

Thor **PORTABLE POWER TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES AND SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

January 1946

Vol. 115, No. 1 — Founded 1880

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In This Issue

ONCE again, as our industry begins a new year, we publish a Directory Number. A complete section lists the products, materials, equipment used by our craft; also addresses of the manufacturers; and for convenience the trade names.

Despite the short time which has elapsed since the end of the war and the short time manufacturers have had to produce and distribute new products, readers will find in this directory many new names and many new products of recognized manufacturers. By the time the 1947 Directory is issued, there no doubt will be many, many more new names and many more new products—for our industry is on the march.

•

Also, in keeping with the many problems which beset our industry, the articles in this issue are, we believe, a pretty fair cross section of those problems.

There are, for example, several timely articles dealing with labor—"We Claim This Work" (a list of the jurisdictional awards we enjoy); "Needed, 5,000 Apprentices" (a most important problem today); "The Chicago Plan for G.I. Apprentices" (a plan which is attracting young men to our craft); "Pictorial Instruction for Sheet Metal Training" (a picture story of N. Y. Trade School instruction).

There are articles on making money in our business—"Dollars and Cents Ceilings May Come" (a warning of what OPA may see fit to apply all over the country); "1946 Tax Economies" (how to save money legitimately); "The Family Partnership"; "The $64 Question in Blower Sales"; "Pancake Dies Save Time."

And, finally, numerous articles on engineering thought which make for better heating or sheet metal production.

We hope you will like this issue.

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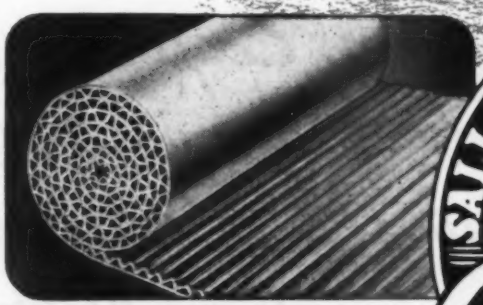
Quality Asbestos Products

Experience of more than 50 years in developing and manufacturing quality Asbestos Products places Sall Mountain Company in a leading position for all kinds of asbestos insulation and fireproofing.

SALL MOUNTAIN COMPANY
Asbestos
UTILITY
SERVICE
ECONOMY



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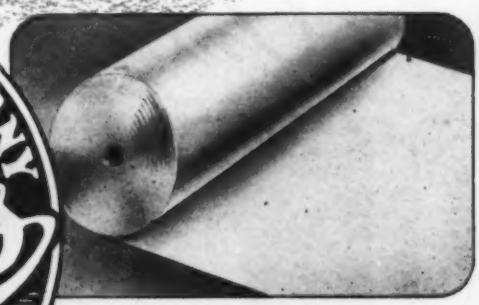
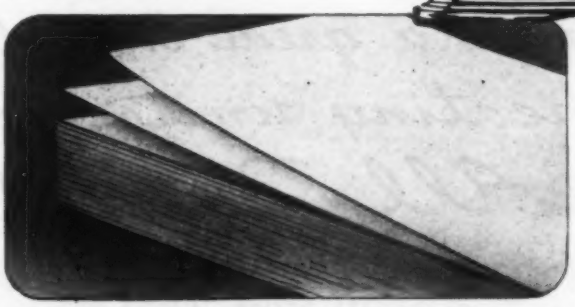
For insulating hot air pipes, gas ovens, range boilers and other surfaces exposed to heat. Protects surfaces from rust and corrosion.



SAL-MO ASBESTOS PAPERS

Made in smooth, strong, white sheets from the best grades of selected asbestos fibre. Specially processed to insure efficient insulation. In all standard weights and widths.



SAL-MO ASBESTOS MILLBOARD

Fire and vermin proof. Sal-Mo Asbestos Millboard is not affected by age or dampness. For insulating stoves, ovens, electrical and heating appliances, protecting walls from heating apparatus.. Standard size sheets; also cut to size.

SAL-MO No. 77 ASBESTOS DUCTBOARD

An Asbestos product for constructing ducts in warm air heating, ventilating and air conditioning systems. Made of solid asbestos. Light in weight; fireproof and moisture proof. Easily handled and applied. 33x48" sheets.

Our new, modern plant is thoroughly up to date and streamlined for the most economical operation. Latest type machinery and improved methods assure our customers the very best in Asbestos Products for insulation and fireproofing.

SALL MOUNTAIN COMPANY

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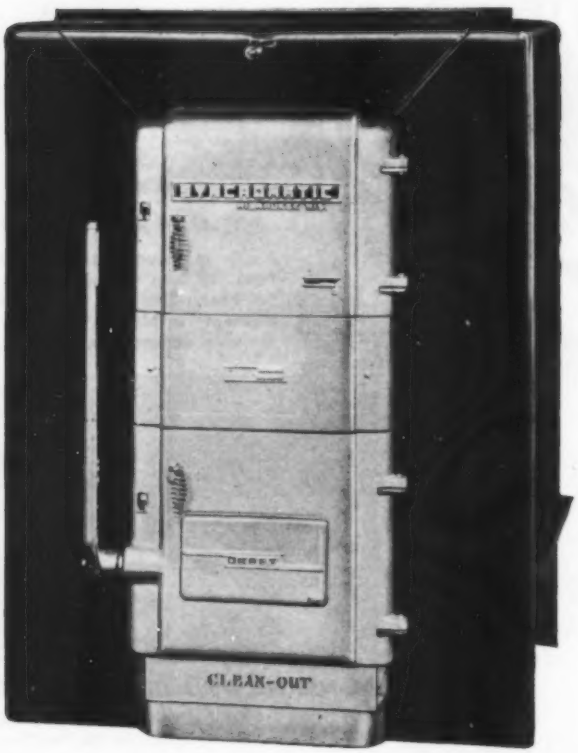
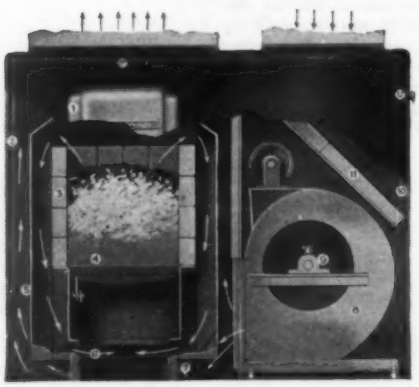
SYNCRO

THE NAME OF THE BEST AND MOST MODERN

Only a Melody can Express
the fine weaving of
Smooth Beauty,
Carefree Simplicity
Safety and Economy
into a great line of
heating units for
All Fuels!



THIS FOR THOSE WHO APPRECIATE DESIGN



Yes! Five sizes in Coal Furnaces, Gravity and Forced air 70,000 to 250,000 B.T.U.

BETTER HEATING FOR BETTER LIVING WITH—"**Syncromatic**"

Factories at
Milwaukee and Watertown
Wisconsin

Syncromatic
YOUR KIND

MATIC

IN HEATING DESIGN AND ENGINEERING

Standardization, along with a *Proven* principle and you have this top efficiency OIL furnace line in **5** sizes. Forced Air and Gravity. 70,000 to 250,000 B.T.U.

AND FOR GAS HEATING

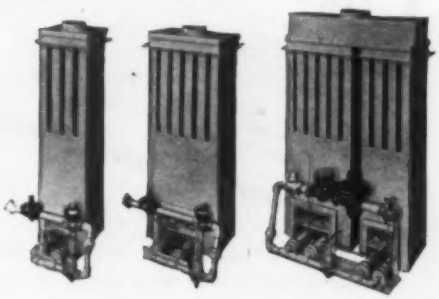
Sure!—

Down deep every GOOD Jobber and Dealer wants to handle this swell, complete line, but only a few more can. Write now! We'll have your nearest Jobber contact you.

You'll really yell for joy when we send you the specifications and prices on this excellent line of GAS furnaces.

Yes, five sizes in GAS!

Forced air — 85,000 to 240,000 B.T.U.



THERE'S A NEW "BEST" IN GAS HEATING—IT'S **"Syncromatic"**

Corporation

OF PEOPLE

General Offices:
5110 North Thirty-Fifth St.
Milwaukee, Wis.

WEIR-MEYER

Three fourths of a century of practical, on-the-job experience lies behind the advanced engineering of WEIR-MEYER equipment.

For three fourths of a century, dealers have known that they could depend on WEIR-MEYER for honest merchandise.

And for three quarters of a century, distributors and dealers have appreciated factory policies that recognize the necessity for legitimate distributor-dealer profit and protection.

During these many years, purchasers of heating equipment have learned to look to WEIR-MEYER for leadership. This merited prestige puts and keeps WEIR-MEYER distributors and dealers in an enviable competitive position.

If your community is not being served by a WEIR-MEYER distributor or dealer, and you are sincerely anxious to build a profitable, sound business, write for complete WEIR-MEYER Franchise facts.

FRANCHISE PROTECTION

The sensible, proven WEIR-MEYER Franchise Plan puts extra profits in your pocket. It protects your investment of time, effort, and money. It enables you to enjoy the benefits of selling equipment that makes owners enthusiastic—not merely satisfied. Get the facts.

TO HELP YOU SELL . . .

Millions of Americans who are planning new homes, and other millions who will remodel present houses are learning about the advantages of WEIR-MEYER Modern Heat through the pages of Home Magazines. Even more aggressive advertising is planned. A variety of Dealer Helps is available to aid you in finding and closing prospects.

MANUFACTURERS OF WEIR AND MEYER FURNACES

OIL GAS COAL

MEANS *Modern Heat* FOR ALL FUELS

THE ULTIMATE IN FULLY AUTOMATIC HEATING

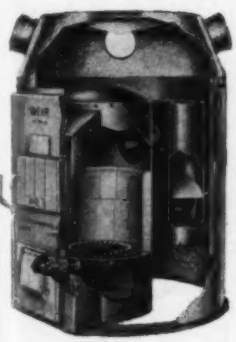
MEYER AIR CONDITIONERS—oil-fired or gas-fired — are beyond comparison. Dealers realize the advantage of service-free construction and performance—Heating Section welded into a gas-tight, leak-proof integral unit; Tubular design that presents maximum heated surface to forced air, assuring rapid heat transfer; ease of installation.

MEYER gas-fired AIR CONDITIONER, pictured above, gives the user a new conception of cleanliness, efficiency, economy of operation. Modern in design and appearance.

MEYER oil-fired AIR CONDITIONER, shown at right, is built for efficiency and durability. Stainless steel combustion chamber withstands intense heat of oil flame and makes installation simple. All WEIR-MEYER Air Conditioners are designed for the addition of mechanical cooling at the time of installation or later.

WEIR U SERIES AIR CONDITIONER

Handsome, smart in appearance, and setting a new standard of efficiency and comfort is the WEIR U Series Air Conditioner for the user of coal. Filtered air is warmed, properly humidified, and forced throughout the home. Truly, WEIR-MEYER dealers are in a position to meet every home heating problem — profitably — competitively.



NEW U SERIES WEIR STEEL FURNACE

Here's an entirely new WEIR Steel furnace. It has the tried, exclusive, famous WEIR features of construction, plus a newly-developed integral front* that puts Weir more than ever in a class by itself. Ready for the market early in 1946. *Patent applied for

THE MEYER FURNACE COMPANY

General Offices

PEORIA 2, ILLINOIS

Factories at Peoria and Peru, Ill.

Since 1866

AIR CONDITIONERS FOR OIL . . GAS . . COAL

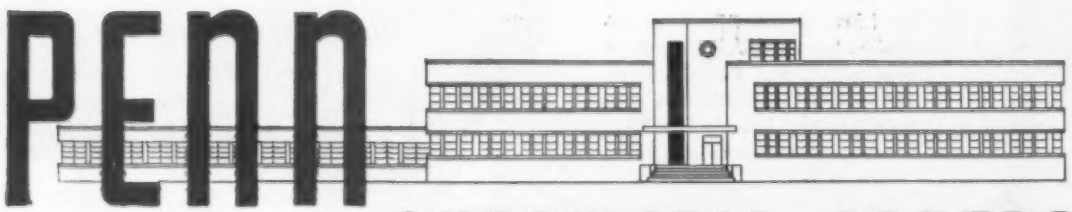
THIS DEAL WINS

Satisfied Heating Customers

• It's in the cards! You're bound to win satisfied customers . . . when you sell PENN Heating Controls. They'll create satisfaction because they're efficient and dependable . . . built to give long life . . . *accurate* performance. Installation is quick and easy.

You can meet every sales opportunity in today's market . . . with this complete line of "field-tested" automatic controls for all types of heating jobs. Take a look at these sales-leaders! PENN Temtrol, the heat anticipating thermostat, that holds temperature closely to selected level, avoids zig-zag heating and conserves fuel. PENN Tem-Clock with its economy and convenience of completely automatic Day-Nite control. Then, there are primary controls, limit switches and relays in this business-building line!

Be sure to get full information on these dependable and efficient controls today. Learn how you can win bigger profits . . . create better satisfied customers. Write *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U. S. A. In Canada: Penn Controls, Ltd., Toronto, Ontario.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Randall

ENGINEERED PILLOW BLOCKS

For Quiet, Efficient Air Handling

The long, trouble-free, quiet service of Randall Pillow Blocks is the result of more than three decades of Randall bearing engineering and manufacturing experience. Since Pillow Blocks were added to the Randall line, TWO AND THREE-QUARTER MILLION have been manufactured and sold for air handling and other types of equipment.

This record is your assurance of quiet, efficient air-handling service. Manufacturers specify Randall knowing that their units will be free from bearing failures and metallic bearing noise in field operation.

The large single or double oil reservoir in the Randall spherical ball provides ample storage of lubricant. The oil feeds through graphite-filled holes and grooves to the shaft providing continuous self-lubrication.

Randall Pillow Blocks permit constant alignment, are easily installed and require a minimum of attention. They stand up under heavy duty requirements with assurance of long service. Specify Randall Pillow Blocks . . . get rugged construction . . . get bearing operation that is especially engineered to your requirements. Write for Randall Catalog No. 42 now!

Representatives Carrying Stocks

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San Francisco, California

Tek Bearing Company
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510 Cambridge St., Boston 34

Salt Lake Hardware Co.
Salt Lake City, Utah

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RANDALL GRAPHITE PRODUCTS CORPORATION

609 West Lake Street Dept. 111, Chicago 6, Ill.

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Repair Parts

FOR ALL HEATING UNITS

IN STOCK FOR IMMEDIATE SHIPMENT
GUARANTEED TO FIT

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BLOWERS & CONTROLS
DRAFT REGULATORS
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FILTERS—DUSTOP
FITTINGS & SUPPLIES
FURNACE CLEANERS
HUMIDIFIERS
REGISTERS
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TIN FITTINGS

IN FACT WE CARRY EVERYTHING TO ENABLE YOU TO MAKE A JOB COMPLETE

BRAUER
REPAIR PARTS
STOVE
FURNACE
BOILER
OIL
STOVE
RANGE

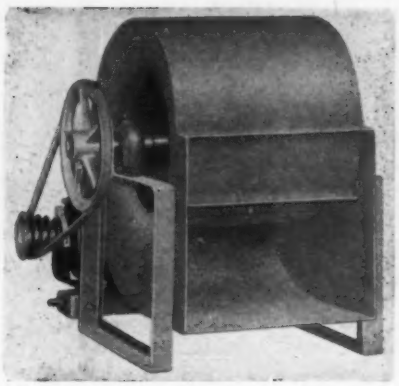
ORDER ALL FROM

A. G. BRAUER SUPPLY CO

2100 Washington Ave., St. Louis, Mo.

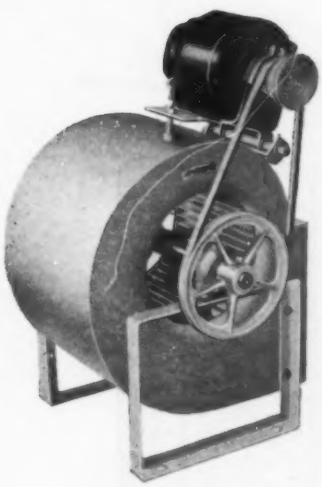
REX BLOWERS

A COMPLETE LINE of centrifugal blowers for better performance



Look to the complete REX line of Blowers to produce top performance from every installation—blowers that meet the specialized demands of forced warm air heating and air conditioning. REX Blowers are recognized for their outstanding, trouble-free service.

The definite superiority of REX Blowers is based on their heavy, rigid construction, smooth operation, their design and operating excellence. They accurately meet the operating demands of most air conditioning installations—meeting these requirements smoothly, quietly and efficiently.



There is a wide range of sizes and capacities—motors can be mounted on the top or rear, and the angle of discharge placed in any direction. The "H-P" type is especially well adapted for use in compact cabinets where space is at a premium.

Over forty years of manufacturing experience gives us the "know-how" when it comes to designing and making blowers. The services of our Engineering Department are available to you in choosing the correct REX Blower for your particular application.

Air CONTROLS INC
Div. of
The Cleveland Heater Co.

2311 SUPERIOR AVENUE **CLEVELAND 14, OHIO**

MASTER
TEMPERATURE CONTROLS

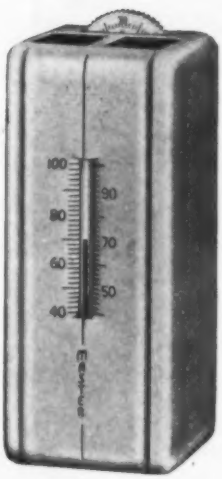
"What Can't Be Cured Must Be Endured"

This philosophy won't deliver any goods, but it will help to save you and us from being too unhappy over a condition that cannot be remedied right now in spite of our best and constant efforts.

B-22 Damper Motor

Our Standard Products

Including those illustrated on this page, are coming off the production line in gradually increasing quantities,—but nowhere near in the volume that our customers and we wish for. What production we have is being divided among customers as equitably as possible.



A-23 Plain Thermostat

New Things In The Making

Be patient with our continued hinting about our several new units. Models have been tested and proven,—but tooling-up is hampered by conditions beyond our control,—to get materials in any practical amount is almost impossible at the moment. All these handicaps and delays have in no way dampened our enthusiasm for the improved and increased service being built into the "White Line".

We Thank You For Your Tolerance

D-22A Regulator Switch

WHITE MANUFACTURING CO.
2368 UNIVERSITY AVENUE ST. PAUL, MINN.

Here's a real start for 1946 Profits!

The Oil Heating Industry is headed into the greatest boom in its history! Facts and figures have proved beyond a doubt that "Mr. John Public" has become oil-heat minded—and the scramble for oil burners is on!

Today . . . it's just a case of "take orders." **But have you thought about what happens after the first buying rush is over?**

Ask yourself this: "Where can I find a product that has something really *new* and tested to offer my prospects—made by a reputable manufacturer who has pioneered 'all the way' in the oil heating industry?"

The answer is a Master Kraft Franchise! Why?—Because Master Kraft *has* something entirely new to offer in oil-heating equipment—it's new and different, thoroughly and successfully tried out in the war.

Selling features on this new line are amazing—two-minute service changes — Band Air Control—pre-heated air—and a host of others! The entire Master Kraft line is new—new design—new in appearance (they're all eye-catchers) and new in selling possibilities!

You can build a fast-growing and successful business with the Master Kraft line of oil-heating equipment—make new customers as well as repeat orders!

This coupon will bring you all the good news about a Master Kraft Franchise —it's *the* franchise for *your* oil-heating future—write today!

HARVEY-WHIPPLE, INC.
SPRINGFIELD, MASS.
DEPT. AA-2

SEND ME COMPLETE DETAILS ON HOW I MAY OBTAIN A MASTER KRAFT FRANCHISE.

NAME .....

ADDRESS ..... STATE .....

CITY .....

Master Kraft Oil Heat

REG. U.S. PAT. OFF.

MANUFACTURED BY

HARVEY-WHIPPLE INC.

SPRINGFIELD, MASS.

Look to CLARAGE*

For Air Handling and Conditioning Equipment . . . .

Shown on these two pages are but a few of the many types of units and systems built by Clarage.

. . . And back of all Clarage products are over thirty years of experience—not only *long* experience in building equipment that gives trouble-free service—but *long* experience in scientifically designing, testing and rating this equipment so that the results you're after are inevitably obtained—and at minimum operating cost.

Yes, if you're thinking of installing air handling or conditioning units for any purpose, Clarage IS a remarkably fine source of supply.

COMPLETE AIR CONDITIONING

For industrial, commercial and public building needs, Clarage builds both central station and unit air conditioners—suitable for complete conditioning, heating or cooling, humidifying or dehumidifying.

The unit conditioners (floor and suspended types) can be easily installed without costly building alterations; used with or without duct work.

VENTILATING FANS

Clarage Fans for ventilating, cooling, heating and air conditioning are made in 28 sizes; 200 to 100,000 c.f.m. There are two types: slow speed for belt drive, and high speed for direct motor drive.

Standard equipment includes self-aligning, dust-proof, oil-light bearings. Fan wheels are both statically and dynamically balanced, insuring quiet, trouble-free operation.

UNICOIL CONDITIONING UNITS

Clarage Unicoil Units combine in a single "package" all elements necessary for efficient air cleaning and heat transfer. Easier and cheaper to install—eliminating time and expense of assembling many different parts. Widely used in central station heating, cooling and complete conditioning systems; large range of sizes.

Standard unit consists of coils, eliminator plates, settling tank and casing. Filters and spray nozzles optional.

Immediate Assistance Available in 45 Cities!

To be of maximum help to architects, engineers, contractors and industry, the Clarage Fan Company maintains branch offices at all the strategic points indicated on the map above.

Each Clarage branch office is manned by experts—by Clarage engineers who KNOW HOW to satisfactorily meet air handling and air conditioning requirements of every conceivable kind.

Whatever your problem, if it's in our field, you will find Clarage engineers eager to cooperate — and you'll like the prompt, intelligent way in which your inquiry is invariably handled.

Either dial our number in your city or write the factory in Kalamazoo.

* * *

CLARAGE FAN COMPANY
Kalamazoo, Michigan

LARGE AREA HEATERS

Clarage Unitherm Unit Heaters are designed for service in factories, mills, etc. They deliver heat at high velocity spreading it uniformly over wide areas. Both floor (as shown) and suspended types are available.

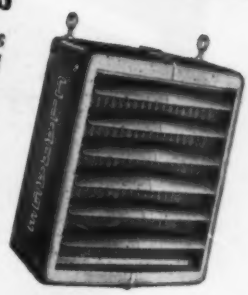
Equipped with centrifugal fans, ball bearings, adjustable outlets, and with coils for pressures up to 200 lbs., these units effect important savings in both fuel and maintenance costs.

Eight Standard Sizes

SMALL AREA HEATERS

For heating small factory areas, buildings where heat losses are concentrated around outside walls, offices, stores, etc., Clarco Unit Heaters are recommended. Built in horizontal (as shown) and vertical types for installation along side walls or at ceiling level.

Unique design of propeller fan assures maximum heat delivery. Motor is totally enclosed, rubber mounted. Units are finished in red and black enamel—strikingly attractive. They are very quiet running.



Sixteen Standard Sizes

BOOSTER FANS

This is a complete line of small centrifugal fans for use in connection with warm air jobs, and as blowers in "package" air conditioners and in central station residential air conditioning. Capacities 200 to 5000 c.f.m. Quiet operation an outstanding feature.

Units are furnished as complete fans (with or without inlet boxes), or wheels only or wheels and housings can be supplied. Also built as duplex units.

Built in Ten Standard Sizes

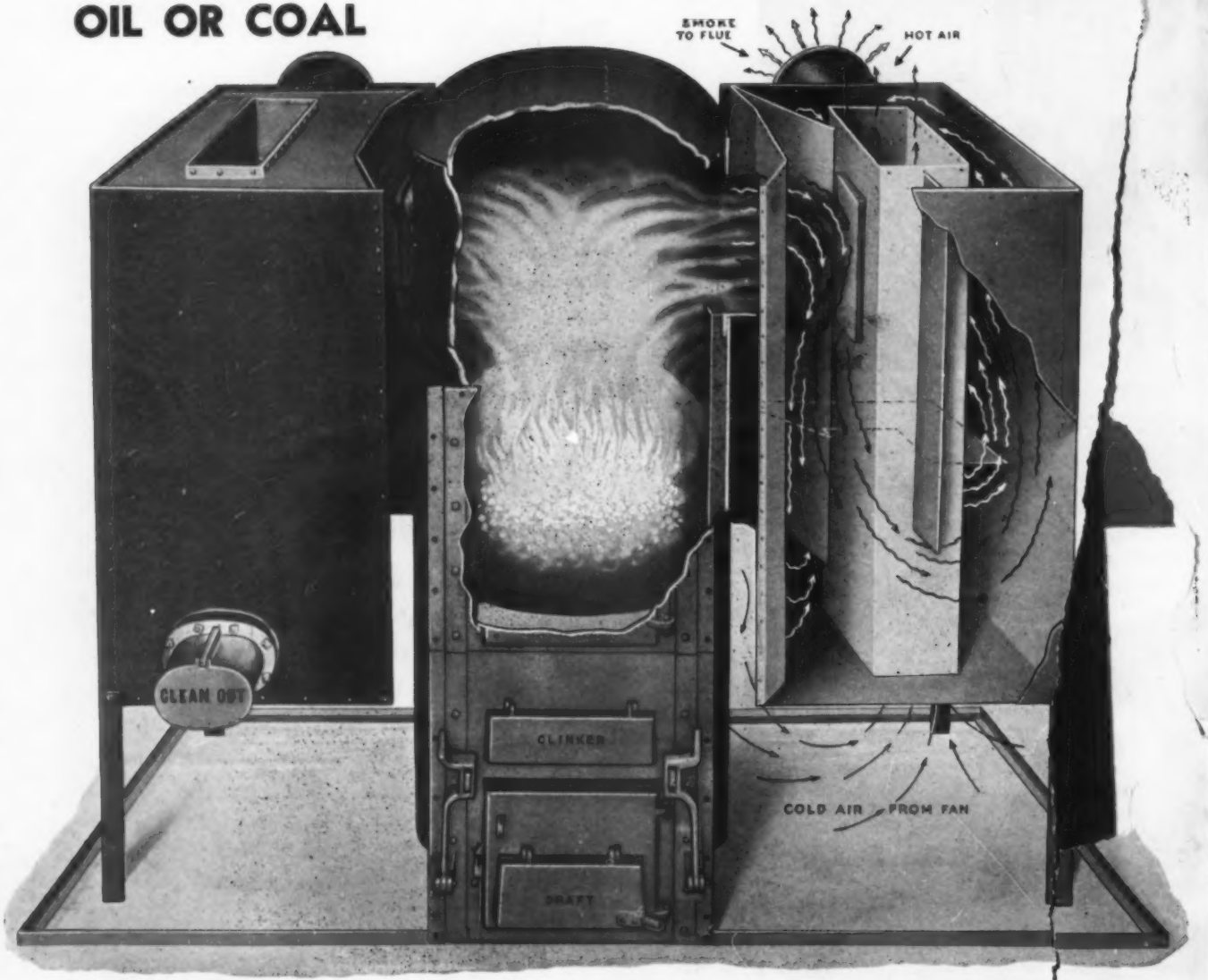
EXHAUST FANS

Clarage Exhaust Fans are made to cover all kinds of exhaust, blow pipe and pneumatic conveying requirements; used for dust collecting, removing fumes, and for conveying through pipe such materials as shavings, grains, etc.

Fan wheels are statically and dynamically balanced. Famous Clarage dust-proof, oil-tight bearings standard equipment. Smaller sizes adjustable for 8 different directions of discharge.

PEERLESS *Commander* Heavy-Duty FURNACE

OIL OR COAL



SPECIFICATIONS—PEERLESS *Commander* No. 750 DR

Diameter Drum (obround)	Height of Drum	Height of Radiator	Grate Area Sq. In.	Grate Area Sq. Ft.	Heating Surface Sq. In.	Heating Surface Sq. Ft.	Ratio Heating Surface to Grate Area	Height to Bottom of Smoke Pipe Collar	Diameter Smoke Pipe	Casing Size	Casing Height	Shipping Weight—Lbs. Less Casing	Shipping Weight—Lbs. With Casing
31½"x48"	66"	46"	1048	7.28	30,959	215	29.55	49½"	14"	91"x58"	75"	3340	3855

FORCED AIR RATINGS

BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU	BTU-Coal	Firing Rate Lbs. Per Sq. Ft. Grate Surface	BTU
11,500	7.5 10.0	486,000 698,000	12,500	7.5 10.0	528,000 759,000
12,000	7.5 10.0	507,000 728,000	13,000	7.5 10.0	549,000 789,000

Specifications on other Peerless Heavy Duty furnaces on request.

Wire or Write for Descriptive Literature and Complete Information on other sizes of Peerless Warm Air Furnaces.

THE PEERLESS FOUNDRY COMPANY, Indianapolis, Ind.

Pioneers in Warm Air Heating for Over a Third of a Century

PEERLESS HEATING UNIT TODAY
OR YOUR HOME OF TOMORROW

• The complete Peerless line of coal, oil, and gas-fired eating units—after a successful war record—is again avail-le for civilian use.

Ready now—in limited quantities—for installation in the mes of tomorrow are the three Peerless basic units. For ose who demand the finest in heating equipment, there's e Master, an up-to-the-minute automatic furnace designed r use with either gas or oil fuel. For those who prefer coal-red furnaces, Peerless offers two styles—the Sensation, an ficient stoker unit; and the round type furnace, a rugged it built for long dependable and economical service.

Yes, there's a Peerless unit for every warm air heating equirement. And into each unit Peerless engineers have corporated many refinements in design and construction for increased efficiency and greater sales appeal.

These modern heating plants, together with a long list of eating supplies offered by Peerless, give the dealer a com-ete heating line—time-tested for more than a third of century.

To insure early delivery of the equipment you need, place our order now. Be ready with a complete heating line—for stallation in those homes of tomorrow.

REPAIR PARTS NOW AVAILABLE

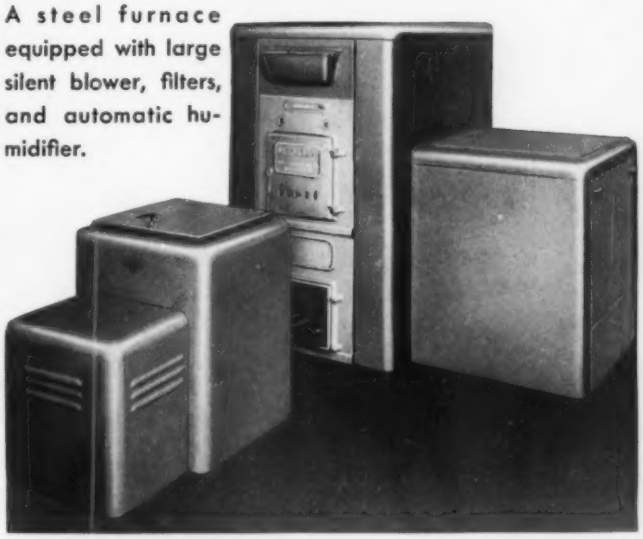
Peerless is still in position to supply parts for most makes and models of warm air heating plants. Orders are being filled as rapidly as possible under present conditions. Give your customers good service now on repairs.

THE MASTER
for Oil or Gas

An automatic furnace designed for small or medium size homes.

THE SENSATION
for Stoker or Hand Fired

A steel furnace equipped with large silent blower, filters, and automatic humidifier.



THE STEEL ROUND-CASED
for Stoker or Hand Fired

A Peerless Furnace built for long dependable and economical service.

•

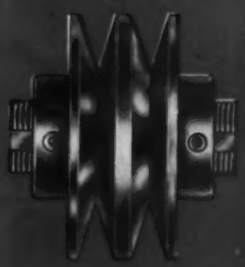
PEERLESS FOUNDRY COMPANY

INDIANAPOLIS 7, INDIANA, U. S. A. • *Pioneers in warm air heating for over a third of a century*

The Answer to your

V-PULLEY PROBLEMS

Cast Iron
Single Groove Spoke Pulley



Cast Iron Two-Groove
Variable Pitch Diameter Pulle

Cast Iron Single Groove
Variable Pitch Diameter Pulle

Maurey V-Pulleys, o
installed, perform c
tinuously without att
tion. Their quality
taken for granted,
cause users quickly
ognize the super
Maurey design
sturdiness.

Use Maurey V-Pulleys
trouble-free perfor
ance.

MAUREY V-PULLEYS

MAUREY MANUFACTURING CORP. — 2515 South Wabash Ave., Chicago 16,

A PROFITABLE MARKET

—that's going to be bigger than ever before

• PROFIT—that's what stainless steel sheet metal work means to the shops that can handle it. Some 15 years of experience have proved this fact to many sheet metal contractors who have worked Republic ENDURO Stainless Steel.

What are you going to do about getting your share of this business? Are you thinking now about future possibilities in your territory? Are you planning on what you can make and for whom you may make it? Are you looking for information on the best ways to work stainless steel and the precautions to take?

If so, write us TODAY for copies of two helpful Republic books, "The Fabrication of Republic ENDURO Stainless Steel" and "The Welding of Republic ENDURO Stainless Steel." They contain detailed information and recommendations on various methods of fabricating and welding stainless steel. They also contain many useful tables.

Both books are free to sheet metal contractors—so write us NOW!

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
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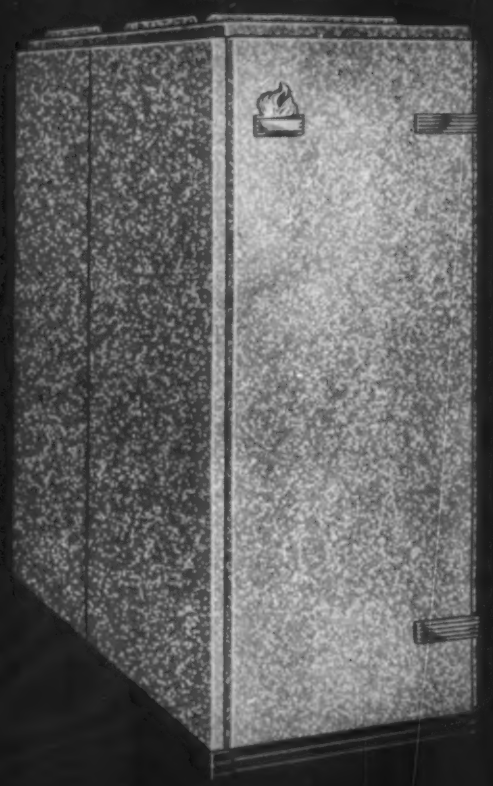
Export Department: Chrysler Building, New York 17, N.Y.

Republic
ENDURO STAINLESS STEEL
Reg. U. S. Pat. Off.

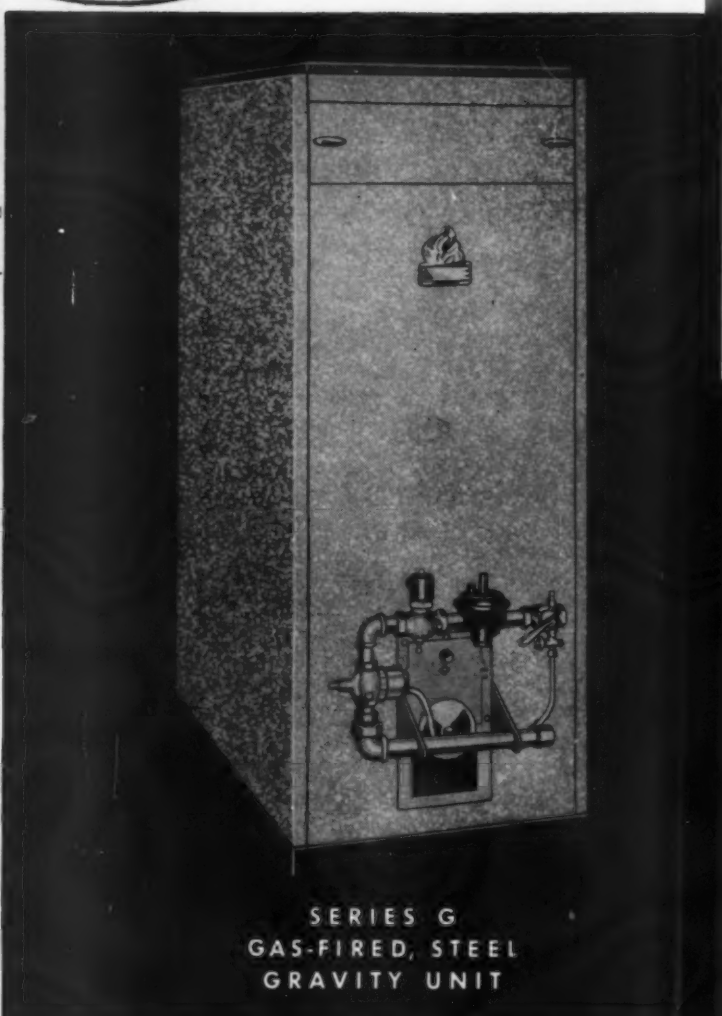
Other Republic Products include Black, Ga[illegible]

Here's the NEWS you've been waiting for!

Meet the Stringent, New Requirements of American Gas Association

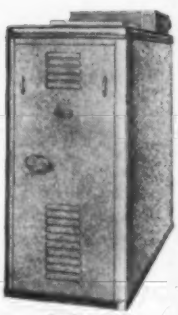


SERIES A
GAS-FIRED, STEEL
AIR CONDITIONING UNITS

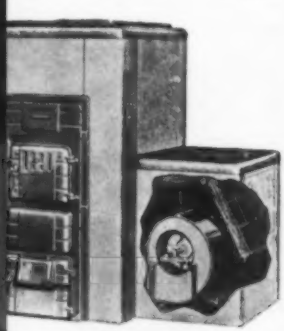


SERIES G
GAS-FIRED, STEEL
GRAVITY UNIT

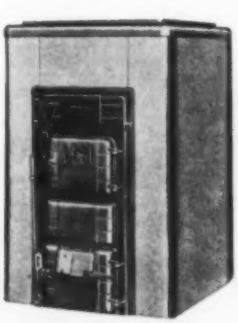
Series M
Gas-Fired, Cast Iron
Air Conditioning Unit



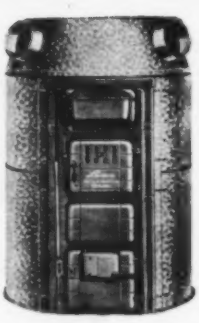
Series 8000
Oil-Fired, Steel
Air Conditioning Unit



Series AC-700
Coal-Fired, Steel
Air Conditioning Unit



Series 700
Coal-Fired, Steel
Gravity Furnace



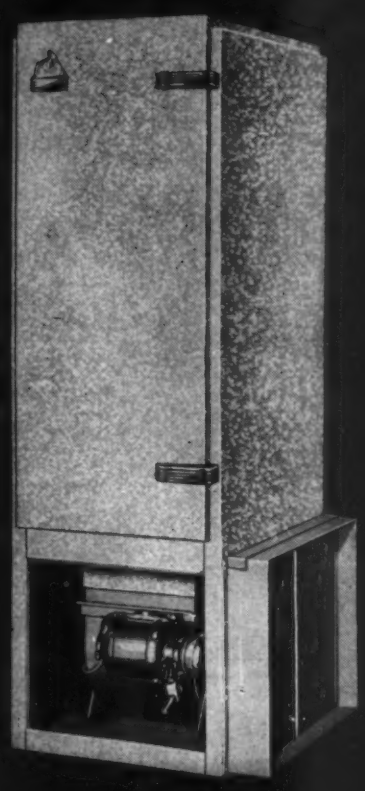
Series 600
Coal-Fired, Steel
Gravity Furnace

Series C
Coal-Fired, Cast
Gravity Furnace

Luxaire's

NEW LINE OF GAS-FIRED HEATING AND AIR CONDITIONING UNITS

- *New Design*
- *New Beauty*
- *Sales Appeal*



SERIES H
GAS-FIRED, UTILITY
STEEL AIR CONDITIONING UNIT

A completely new line—revolutionary in design—revolutionary in construction.

Introducing to the heating market exclusive features found only in Luxaire Gas-Fired heating and Air Conditioning Equipment.

New Heating Element! New Burners! Distinctive Luxaire Cabinet! New Blowers!

These advanced units are the result of years of designing, experimenting and testing by Luxaire heating engineers.

Many manufacturers have until 1947 to meet the stringent, new requirements of the American Gas Association. However, the post-war Luxaire Gas-Fired units already have complied with these requirements and have successfully passed the A.G.A. tests.

Luxaire's superior heating qualities have been proven and tested—both in the laboratory and in actual home heating.

Luxaire's new line of Gas-Fired equipment—longer lived—more efficient—easier to install—easier to service—will soon be rolling off the production lines.

Production has been resumed on Luxaire oil-fired and coal-fired air conditioning units and will be increased as fast as conditions permit.

NOW! Luxaire offers a complete line of superior heating and air conditioning equipment for Gas . . . Coal . . . Oil.

Luxaire

THE C. A. OLSEN MANUFACTURING CO. - ELYRIA, O.

WHITE-RODGERS
Controls for Heating

Room Thermostat

Heavy-duty line-voltage room thermostat with uniformly calibrated dial. Ideal for unit heater and air-conditioning installations. Hydraulic-Action provides positive, accurate control. No relay necessary on most installations. Series 150.

Hydraulic-Action Space Thermostat

For use on garage, warehouse, factory and similar applications. Provides unusually close control where temperature change is rapid. Ideal for use with unit heaters. Remote types available to control duct temperatures. Series 200.

Warm-Air Limit Control

Provides protection for warm-air furnaces against excessive temperatures. Hydraulic-Action, flexible element permits easy installation. Evenly calibrated dials for accurate adjustment, no temperature drift. May be used on line or low voltage. Series 400.

Room Thermostat

Outstanding for beauty and reliability. Heat anticipating. Unbreakable ivory case, with chrome trim. Hinged cover conceals thermometer and Touch Temperature adjustor. Low voltage. Series 120.

Combination Fa and Limit Contr

For use on forced warm heating systems requi accurate fan control positive limit protect Hydraulic-Action, no perature drift. Fl mounting because of ible elements. Line or voltage. Series 500.

Immersion Hot Water Control

Single-immersion circulator or limit control available with vertical or angle well. Highly responsive Hydraulic-Action element. Dual-immersion types also available. Series 1100.

Stoker Timer

Dependable White-Rodgers line-voltage stoker timer incorporating slow-speed synchronous motor with sealed-in lifetime lubrication. Available with or without fused line switch. Series 700.

Room Thermostat

Light-duty line-voltage room thermostat with Touch Temperature adjustor. Visible recessed thermometer. Sturdy steel case. Rugged double-contact switch mechanism. Series 180.

Room Thermostat Heat Anticipating

Trim, modern, low voltage room thermostat with Touch Temperature Adjustor and visible recessed thermometer. Attractive ivory and chrome finish. Series 130.

Hot Water Limi Surface Type

Fixed and adjustable ferential types are a able, for use with e line or low voltage. T inch coiled Hydra Action element for su contact to assure quic sponse. Easily instal need not be leveled. S 1100.

Solenoid Gas Valves

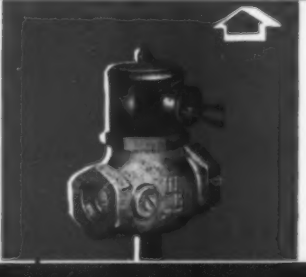
Improved engineering design — no magnetic hum. Higher plunger force provides positive valve action. Types for line or low voltage. Series 2500.

Diaphragm Gas Valve

Diaphragm valve with built-in Hydraulic-Action mechanical limit control combined into one easy-to-install unit.

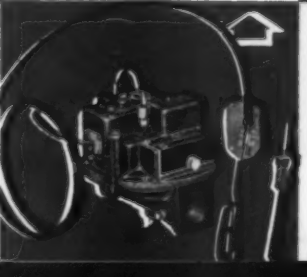
Steam Limit Control

Pressure operated with snap-action line or low voltage switch. Differential constant over entire range. Evenly calibrated, easy-to-read dials with key or screw driver adjustment. Series 1200.



Automatic Night Set-Back Timer

Used with Types 124 or 134 thermostats for automatic day and night control of heating plant. Separation of thermostat and timer provides greater accuracy with simplicity of installation and operation. Series 2400.

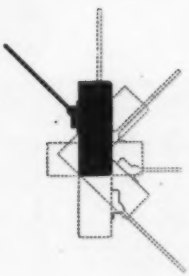


Damper Mo

For use with Type 13 mostat to provide au damper control for fired heating installa Series 2000.

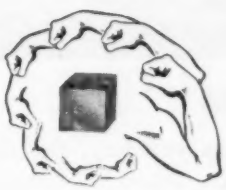
8 FEATURES OF WHITE-RODGERS

HYDRAULIC-ACTION TEMPERATURE CONTROLS



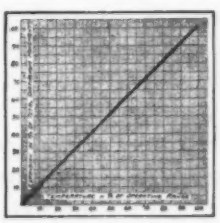
1 Easy to Install

Saves you time and labor. Mount flush, at any angle or in any position, above, below or on level with control point. Two or more controls may be mounted in single case. Flexible element or capillary may be bent or adjusted to fit any control area.



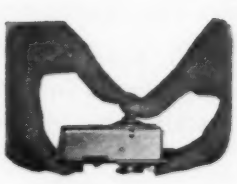
2 Reliable Operation

Eliminate costly service calls — the tremendous power of Hydraulic-Action means long, trouble-free performance.



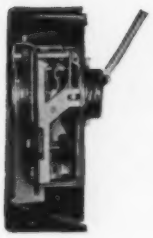
3 Uniform Control

No worries when unusual "settings" are necessary—White-Rodgers Controls give the same positive accuracy at any point throughout the dial range.



4 Sturdy Switch

Simplifies your installations —no relay or motor starters necessary on most applications because the rugged snap-acting switch mechanism possible with Hydraulic-Action, will handle higher electrical capacities.

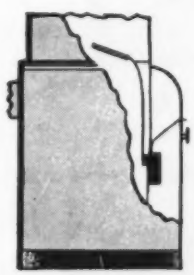


5 Longer Service

More complete satisfaction for the users of the heating plants you install. Hydraulic-Action makes it possible to successfully construct controls using heavier longer wearing parts.

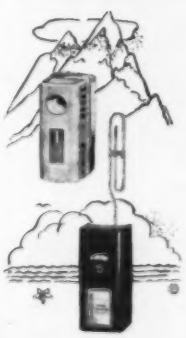
6 Simple to Set

Dials are easy to read, evenly calibrated in degrees Fahrenheit, to permit exact setting of control for each installation.



7 Flexibility of Installation

Here's the answer to those "tough ones." White-Rodgers remote bulb type controls are actuated ONLY by the temperature at location of bulb—accuracy is NOT AFFECTED by changes in temperature along capillary or where switch is located.



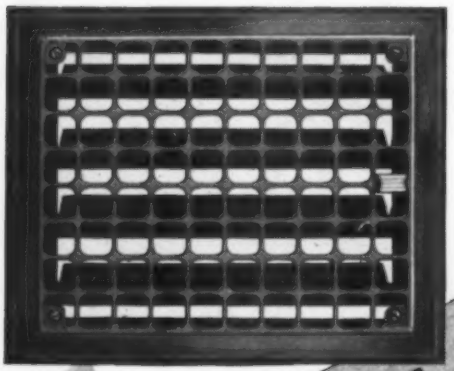
8 Need No Re-calibration

Eliminate unnecessary calibration worries. White-Rodgers Hydraulic-Action controls operate accurately ANYWHERE as set at factory—they require no correction of calibration for changes in altitude or atmospheric pressure.

WHITE-RODGERS ELECTRIC CO.

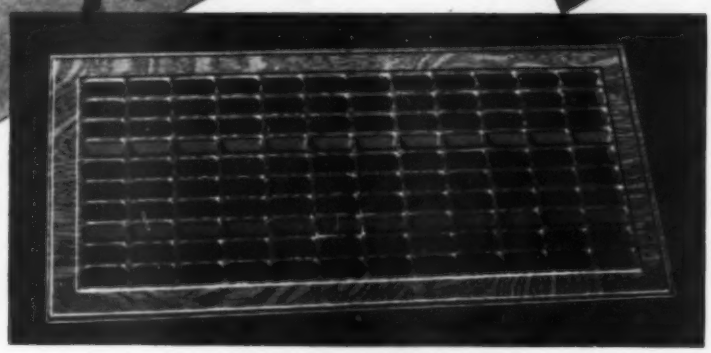
Controls for Heating • Refrigeration • Air Conditioning

3209 CASS AVENUE • ST. LOUIS 6, MISSOURI

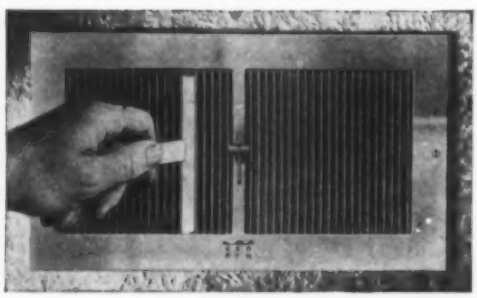


H&C No. 200 Steel Floor Register.

TWO OLD FAVORITES To The Rescue!



H&C No. 255 Steel Return Air Face.



H&C No. 75 Design—the only A.C. Register to employ the incomparable Turning Blade Valve.

H&C No. 130—the best designed, best made Baseboard Register for Gravity or Reconversion.

As with most everything else you buy, the demand for Registers and Return Air Faces is temporarily beyond the capacity of the industry.

To ease the situation we have again called back to duty those two old favorites, No. 200 and No. 255, since we can make several times as many of these in any given period as we can of our No. 210 Floor Registers and No. 265 Return Air Faces. And that, in our estimation, is the way in which we can best serve our customers. Both items are quality products that will meet with your customers' complete approval. Your jobber is doing his best to get the most registers to you in the shortest possible time. Support him in this emergency by accepting *either* No. 200 or No. 210 and *either* No. 255 or No. 265. All other items in both our Gravity and Air Conditioning lines of Registers and Furnace Accessories remain unchanged.

To help yourself and us as well, order strictly in conformity with sizes and finishes listed in Bulletin S-121. Watch for our new catalog, No. 46, which soon will be in distribution.

No. 200 Sizes being made: 6x8, 8x10, 8x12, 9x12, 10x12, 12x14. Case lots: sizes through 9x12-10; 10x12 and over - 5.

No. 255 Sizes being made: 6x30, 8x30, 10x30, 12x14, 12x30, 14x30, 16x30, 18x30, 20x30. Case lots: sizes through 16x30 - 5; 18x30 and over - 10.

H&C

HART & COOLEY MANUFACTURING CO., HOLLAND, MICH.

World's Largest Manufacturers of Registers, Grilles and Furnace Accessories

CHECK THE FACTS

AND YOU'LL FIND...

THIS ONE FRANCHISE HAS EVERYTHING!

✔ **IMMEDIATE VOLUME PRODUCTION OF EQUIPMENT...** to give you oil burners *for today's installations* designed to burn the fuel oils of tomorrow.

✔ **EXPANDED ENGINEERING AND RESEARCH DEPARTMENTS...** whose policy is to "engineer against engineering, not against the coal shovel"... assuring new products that will set new standards for the industry.

✔ **A NEW TYPE OF SERVICE TRAINING, AT THE FACTORY AND IN THE FIELD...** to help you build the kind of Service Department that will *build your business.*

✔ **AGGRESSIVE, TIMELY ADVERTISING AND SALES PROMOTION...** to help you expand your market and to make sure you develop each year, a *larger share* of the growing automatic heating business in your territory.

✔ **BUSINESS-BUILDING DEALER COUNSEL...** through direct factory representatives whose main job is *to help each dealer, in every way, develop his entire business on a sound basis.* Only with Oil-O-Matic's direct factory-to-dealer plan can such a service be given.

WILLIE O-MATIC says: "Ask yourself this question— Point for point, what other oil heating franchise can match Oil-O-Matic?"

OIL-O-MATIC

HEATING SYSTEMS

WILLIAMS OIL-O-MATIC DIVISION, Eureka Vacuum Cleaner Company, BLOOMINGTON, ILL.

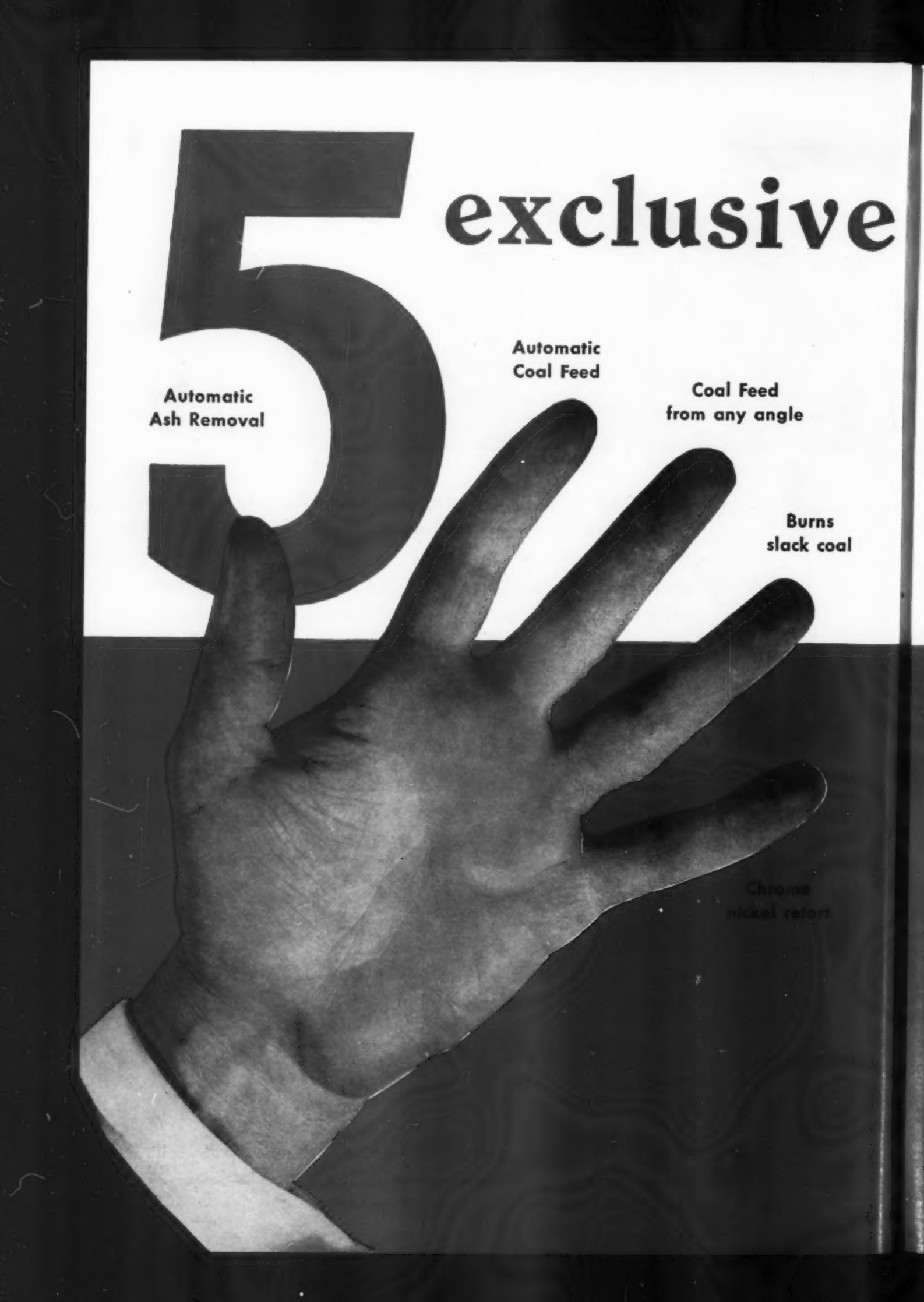
5 exclusive

Automatic
Ash Removal

Automatic
Coal Feed

Coal Feed
from any angle

Burns
slack coal



e stoker features

Will give Pocahontas Dealers the same outstanding leadership for 1946—they have enjoyed for over ten years—Yes! more than ever before the public wants Pocahontas Stokers.

• As the pioneers of bin-feed ash removal bituminous coal stokers we take this opportunity of wishing our present dealers and all those who may be considering our equipment, a Happy and Prosperous New Year, and pledge that we will continue to maintain the high quality of our product—carry on the same everlasting research and development—strive our utmost to fulfill the ever increasing demand for Pocahontas equipment.

POCAHONTAS FUEL COMPANY INCORPORATED
338 EAST 131st STREET CLEVELAND 8, OHIO

POCAHONTAS

THE FIRST SUCCESSFUL BIN-FEED ASH REMOVAL STOKER

AVOID THIS MESS!

This annual Mess can be avoided by the simple installation of modern, long life VITROLINER BREECHING PIPE (smoke pipe).

VITROLINER Breeching Pipe

(Smoke Pipe)

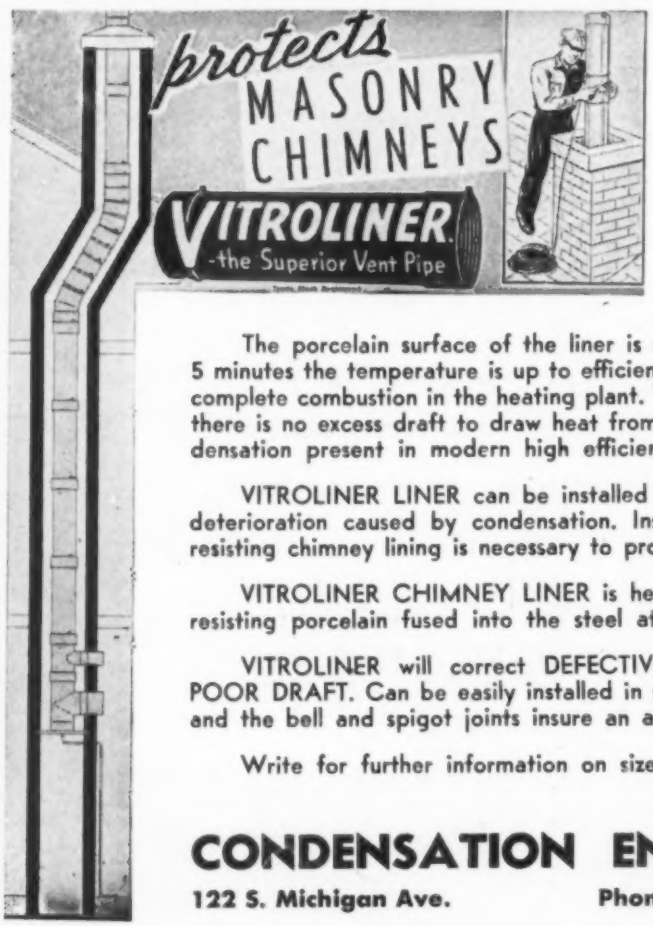
PROVIDES A LONG LASTING, SAFE, AND HIGHLY EFFICIENT CONNECTION BETWEEN HEATING UNIT AND CHIMNEY.

The VITROLINER damper section has a clean-out hole covered with a sliding sleeve, which permits vacuum cleaning without dismantling. Removing the sleeve permits the installation of a barometric or check damper. Small holes provide for butterfly damper.

VITROLINER COSTS LESS TO USE!

VITROLINER is a new, LONG LIFE breeching pipe for connecting heating plant to chimney, and will give many years of trouble free service. Eliminates the expense and bother of frequent replacement. A complete line of fittings makes any hookup possible and can be easily and quickly installed. VITROLINER eliminates the fire hazard of corroded pipe. VITROLINER is made of heavy gauge steel, completely protected inside and outside with porcelain fused into steel to prevent corrosion. VITROLINER'S permanent porcelain finish is attractive and adds to the beauty of any room.

The Telescope section is adjustable in length and is used to fill in any odd length not accommodated by standard lengths. Eliminates need for cutting pipe. Installed at chimney end of breeching pipe. Vitroliner is ideal for venting dust, gas, corrosive fumes, paint spray, etc.



VITROLINER Chimney Liner

Creates More Draft!

Better Heating Efficiency!

The porcelain surface of the liner is smooth, even, and is quickly heated and cooled. In less than 5 minutes the temperature is up to efficient operating temperature, thus providing maximum draft and complete combustion in the heating plant. When heating plant is off, the liner cools immediately, and there is no excess draft to draw heat from the house. The Vitroliner liner is not harmed by acid condensation present in modern high efficiency heating plants.

VITROLINER LINER can be installed in existing chimneys, easily and quickly—prevents chimney deterioration caused by condensation. Inspection of thousands of brick chimneys proves that an acid resisting chimney lining is necessary to protect the brickwork.

VITROLINER CHIMNEY LINER is heavy gauge steel, double coated inside and outside with acid resisting porcelain fused into the steel at 1575° F.

VITROLINER will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT. Can be easily installed in straight or offset chimneys. All sections are made on dies and the bell and spigot joints insure an accurate and uniform fit.

Write for further information on sizes, prices, etc.

CONDENSATION ENGINEERING CORPORATION

122 S. Michigan Ave. **Phone Harrison 8388** **Chicago 3, Illinois**

BEGINNING with the early coal-fired furnaces that bore the Niagara trade mark fifty-six years ago, quality and durability have always been first considerations in Niagara heating units.

During these 56 years more than a quarter of a million Niagara furnaces have been built. These furnaces have given billions of hours of heating satisfaction to Niagara owners.

Today the demand for Niagara heating equipment is beyond our manufacturing capacity, because of shortages in materials, parts and labor. If you want Niagara, we regret we must ask you to wait. But when Niagara equipment is available again in large numbers, you will find Niagara a line that builds profits and prestige for heating dealers.

THE FOREST CITY FOUNDRIES COMPANY

2500 WEST 27TH STREET • CLEVELAND 13 OHIO

NIAGARA

GRAVITY AND WINTER AIR CONDITIONING UNITS

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Here they are!

MONCRIEF'S

Easier to Install... Easier to Service. Easier to Sell!

The Heating Line with Greater Profit Possibilities

Moncrief—again out in front—a Leader in Gas-Fired Heating and Air Conditioning Equipment.

The experience of many years in designing, experimenting and testing quality heating equipment is built into Moncrief's New 1946 line of Gas-Fired Equipment.

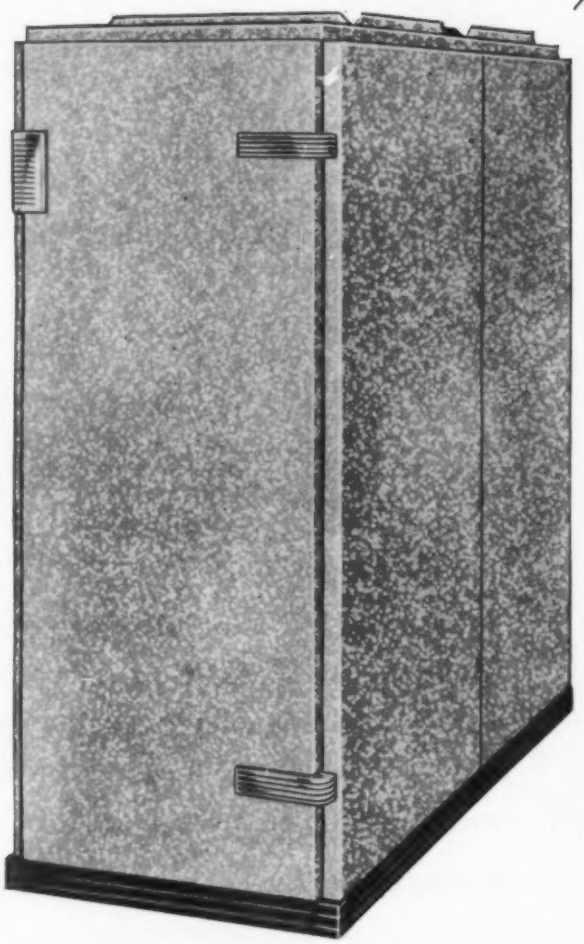
This 1946 line is entirely new from top to bottom—Smartly styled Cabinets—Heating Elements, Burners, and Blowers are "years ahead" in design and operating efficiency.

Moncrief units have successfully passed the exacting laboratory tests of the American Gas Association's latest requirements for Gas-Fired Heating Equipment.

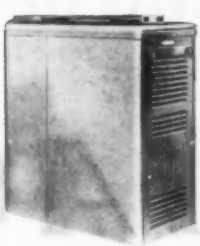
High operating efficiency has been achieved in laboratory and actual home installation tests.

The NEW MONCRIEF line provides profit opportunity for the dealer. All units are easier to install—easier to service—they're more efficient—with longer life—and with unusual Sales Appeal in their styling.

MONCRIEF—the complete line for Gas . . . Oil . . . Coal.



SERIES L
Gas-Fired, Steel Air Conditioning Unit



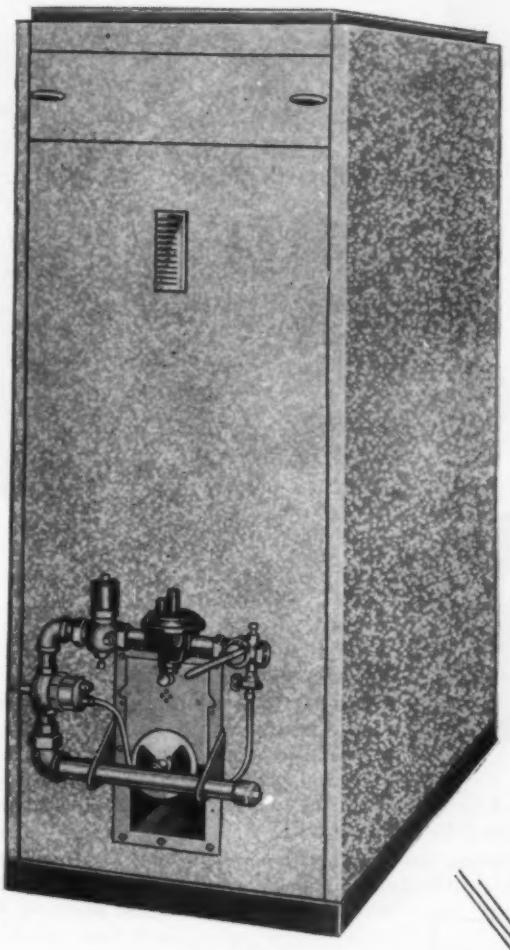
SERIES G
Gas-Fired, Cast Iron
Air Conditioning Unit

SERIES 8000
Oil-Fired, Steel
Air Conditioning Unit

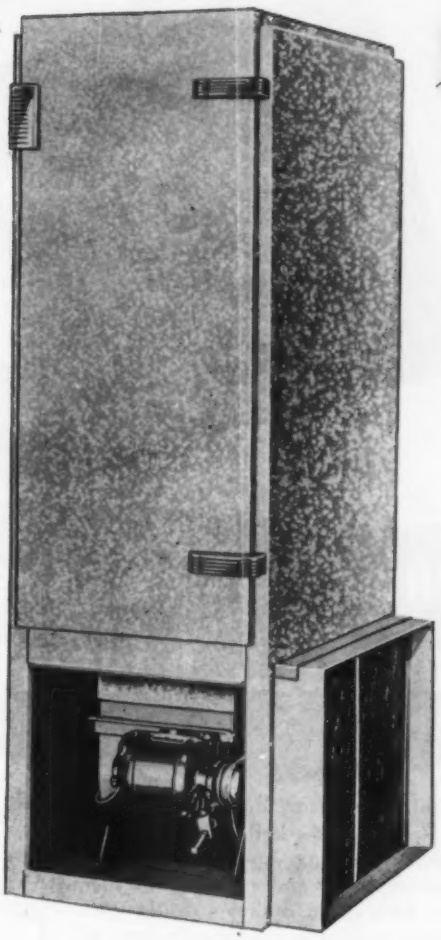
SERIES AC-
Coal-Fired, S
Air Conditioning

★ ★ ★ THE HENRY

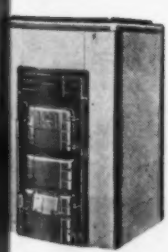
NEW 1946 LINE OF GAS-FIRED
Furnaces and Air Conditioning Units



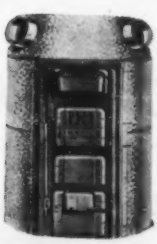
SERIES W
Gas-Fired, Steel Gravity Furnace



SERIES U
Gas-Fired, Steel Utility Air Conditioning Unit



SERIES 700
Coal-Fired, Steel
Gravity Furnace

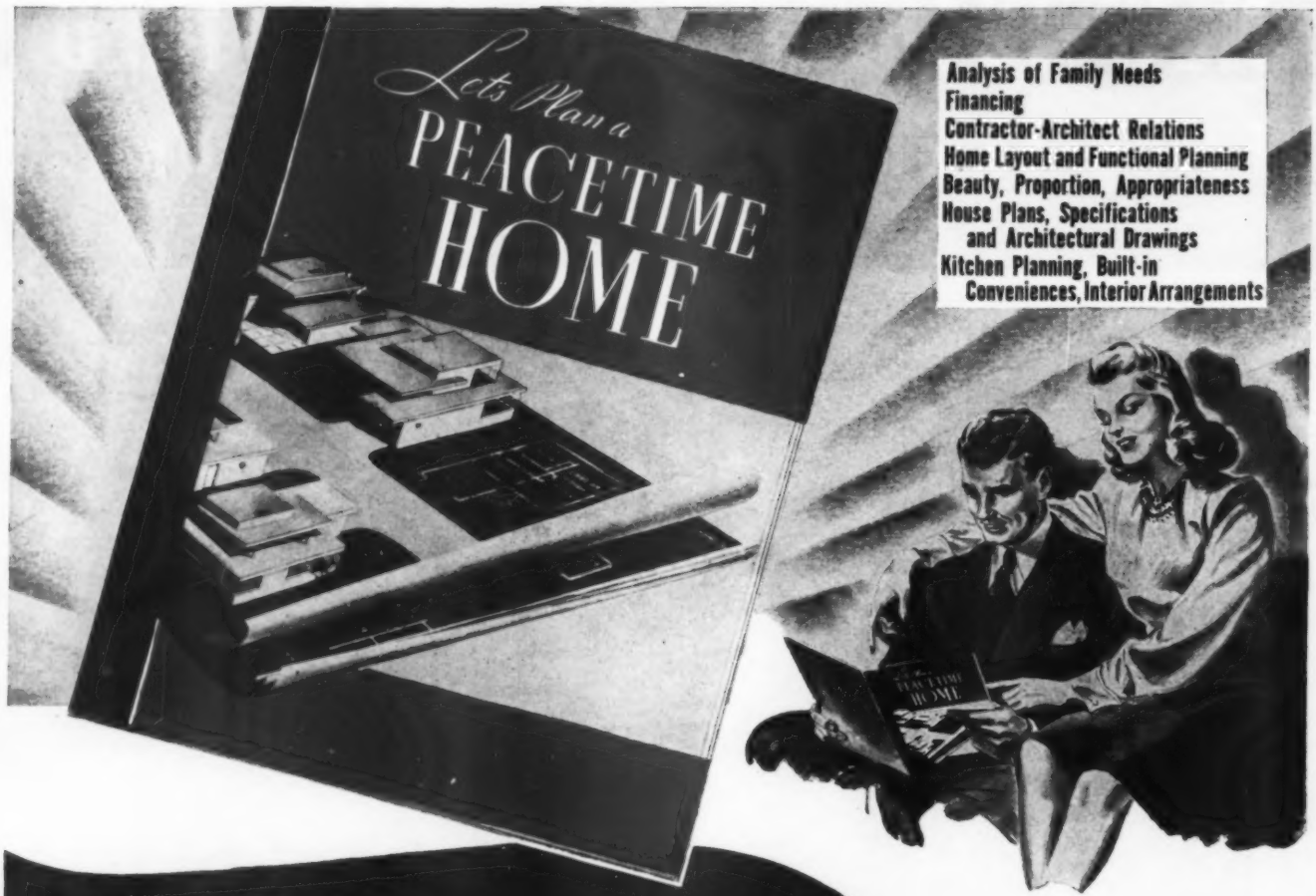


SERIES 600
Coal-Fired, Steel
Gravity Furnace

SERIES C
Coal-Fired, Cast
Iron Gravity Furnace

MONCRIEF
SINCE 1895

FURNACE CO • MEDINA, OHIO ★ ★



WHEN YOUR CLIENTS READ THIS
Your Job becomes Easier!

THE only sure way to long-lasting liveability and solid comfort is for a home builder to consider *heating* with every step in home planning. And the planning of homes that make provisions in design and financing for adequate heating helps you, too, because it makes installations simpler and enables you to handle *more* of the postwar flood of customers.

"Let's Plan a Peacetime Home" keeps customer thinking along sound practical heating lines in planning their new homes. In addition to the subjects shown above, this book also covers the advantages and applications of automatc gas heating and describes gas heating equipment. It's literally *packed* (all 114 pages of it) with the facts that will help home builders come to a sound decision on heating.

So, when a customer who has read this book comes to you, he has his home *planned* to include gas heating; he knows what he wants; and there will be fewer time-wasting, headachy problems in making the installations.

We're distributing this book nationally at $1.00 a copy. We believe it's the biggest planning book value offered today. Send your check or a dollar bill for your copy now. After reading it, you'll probably want to order additional copies for use with your prospects. Write Dept. AA, Surface Combustion Corporation, Toledo 1, Ohio.

Promotion of worthwhile material, helpful to the entire building industry is typical of Janitrol's leadership, not only in the research and development of the most modern gas-fired heating equipment, but also in unique merchandising *methods.*

Janitrol
GAS-FIRED HEATING EQUIPMENT

HELP YOUR CUSTOMERS HAVE A WARM GOOD MORNING

Install a Crise Control on every customer's hand-fired furnace — steam, hot water, warm air.

Set control at night for a warm house in the morning. Re-set in the morning to maintain comfortable daytime temperature.

WHAT'S IN IT FOR YOU?

- ★ Crise quality Control cuts coal consumption as much as 20% each season — soon pays for itself — creates good will for you.
- ★ Your customers are ready to buy — they must stretch their coal this winter.
- ★ Not a luxury, all your customers can afford them.
- ★ A generous margin of profit for you.
- ★ Crise Controls are quick and easy to install — you handle more jobs and make more money, in less time.

See Your Crise Jobber Today — he has Crise controls in stock.

W. Leach

Executive Vice-President

The CRISE MANUFACTURING CO.
COLUMBUS 16, OHIO

A CHALLENGE

THE NEW LAU BLOWER AGAINST THE FIELD

...Performance-wise!
...Price-wise!

SPECIAL FEATURES
Patents Applied For

• We've designed and redesigned—tested blowers—tested wheels—tested bearing supports. Based upon these exhaustive tests, we've engineered the new Lau Series "A" Blower for greater mechanical strength . . . greater efficiency . . . in a more compact unit . . . lending itself to mass precision production . . . at STILL LOWER COST THAN EVER BEFORE. New 3-point suspension-type bearing and bracket form an integral part of the shroud—frictionless, self-aligning—completely encased in Neoprene. New 1-piece motor mounting applicable to any angle discharge—easily convertible, rear to top or vice versa, by simple use of two sheet metal screws. Many other new and exclusive features. SMALLER OVERALL SIZE *fits more jobs.* The Series "A" Blower conforms perfectly with manufacturers' ideas today of building smaller cabinets, yet nothing in our new unit is sacrificed—instead, we offer a more efficient blower. Write for complete description, dimensions, performance data, and prices.

Amazingly LOW COST

We engineered this New LAU Blower and geared a production line to mass produce it at unheard of low unit cost. NOW, no one can afford to buy components for assembly —waste labor—secure uniformless results of hand work. Buy the complete assembly from LAU for LESS!

New **CENTER-SUSPENSION WHEEL**

• Exhaustive tests have proved the center-suspension wheel is still far superior to any other type of construction. The New LAU Series "A" Blower Wheel has more advantages . . . greater mechanical strength . . . truer concentricity . . . greater air flow into the wheel (than other wheels of similar diameter and blade length). DETAILS GLADLY SUPPLIED TO INTERESTED PARTIES UPON REQUEST.

THE **LAU** BLOWER COMPANY

DAYTON 7, OHIO, U. S. A.

WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

Engineers and fabricators of general Air Handling Equipment • Single Inlet and Double Inlet Blowers • Propeller Fans • Accessories

WHAT'S IN A CARLOAD?

WEIRZIN
Electrolytic Zinc-Coated Sheets and Strip, Plain or Bonderized

WEIRITE
Hot-Dip and Electrolytic Tin Plate, Tin Mill Black Plate, Plain or Bonderized, and Special Coated Manufacturing Ternes

WEIRTON
High-Carbon Strip

WEIRALEAD
(Lead Alloy) and Long Terne Sheets

WEIRCOLOY
Galvanized Sheets and Roofing Products

WEIRTON N-A-X
High-Quality Low-Alloy Steels

LACQUERED
and Coated Steel Strip

ALSO
Cold-Rolled Sheets
Cold-Rolled Strip
Hot-Rolled Sheets
Hot-Rolled Strip
Structurals

Carloads from Weirton may contain more than steel: they frequently carry faster deliveries—money-saving and time-saving that add up to increased profits for customers.

Integrated management—with all executives available right at the mill, and in constant touch with production, sales, shipments and laboratory work—means prompt decisions on customer problems . . . *eliminating delays when answers are needed fast.*

Integrated operations—with many types of steel products made "under one roof"—permit Weirton to combine many-product orders into single shipments for individual customers . . . with deliveries speeded, and unloading and handling costs at delivery points reduced.

One of the few completely integrated steel mills in the country, Weirton renders cost-cutting, time-saving services that are difficult to equal in the steel industry. If you need diversified types of steel, and prompt decisions on your steel problems, you will save money by doing business with Weirton.

WEIRTON STEEL CO.

WEIRTON STEEL COMPANY

A Division of NATIONAL STEEL CORPORATION

Still the GREATEST *Buy* in Drill History!

½ in. Special Duty

SKILDRILL

Model "80"

WEIGHS ONLY 8 LBS.

MUCH SMALLER SIZE

MORE COMPACT

GETS INTO TIGHT SPOTS

$48

● It's the lightest weight, most compact, easiest handling ½ in. drill made . . . and its outstanding performance is backed up by the finest quality in every detail. For instance, 100% anti-friction bearing construction . . . extra capacity motor . . . 100% overload capacity switch, helical cut gears of finest steel . . . die cast aluminum alloy body . . . and many other quality features. No wonder Model "80" SKILDRILL is still the *greatest buy* in drill history!

Ask for Model "80" SKILDRILL by *brand name* when you call your distributor.

SKILSAW, INC. 5033-43 Elston Ave., Chicago 30, Ill.
Factory Branches in All Principal Cities

PORTABLE ELECTRIC

SKILTOOLS

MADE BY SKILSAW, INC.

"THE SHOW MUST GO ON"
FOR 1946

Standardization of Gravity and Air-Conditioning Register Styles and Sizes will Assist the Register Industry in meeting a Pent-Up DEMAND of five Years Accumulation.

Homes must be Built—Heating Plants repaired, remodelled and replaced.

Returned Servicemen must be furnished with homes—the Increasing Population must have homes.

Do your part—Save Operations Cost—Increase your Volume—thus more ultimate Profit by Standardizing on the following Styles of U. S. Products.

U. S. GRAVITY and AIR-CONDITIONING REGISTERS LEAD in the Register Industry

Standardized Styles and Sizes Recommended (Other Sizes Available).

No. 40 U. S. BASEBOARD REGISTER

Recommended. Standardized Sizes.

No. 43½—10x8—2¼"

No. 42½—12x8—2¼"

No. 44¼—12x9—3¼"

No. 456—13x11—5¼"

Other Cataloged Sizes Available on Special Order

No. 153 AIR-CONDITIONING REGISTER

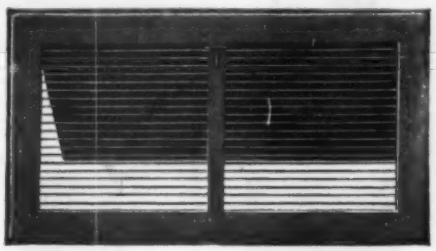
Recommended. Standardized Sizes. Registers (Single Valve).

10x6
12x6
14x6

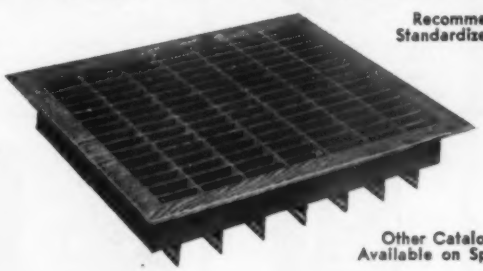
Other Sizes Available

Intakes Nos. 175-177
10x6
12x6
14x6
24x6
30x6

Other Sizes Available



No. 400 TRUSSTEEL FLOOR REGISTER



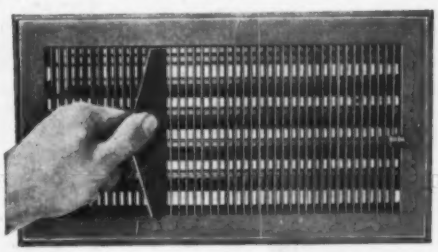
Recommended. Standardized Sizes.

8x10
9x12
10x12
12x14
14x16

Other Cataloged Sizes. Available on Special Order.

No. 256 AIR-CONDITIONING REGISTER

(Bendable Bar.) Recommended. Standardized Sizes.



REGISTERS (Multi-Valve)
10x6
12x6
14x6

Other Sizes Available

Intakes Nos. 176-178
10x6
12x6
14x6
24x6
30x6

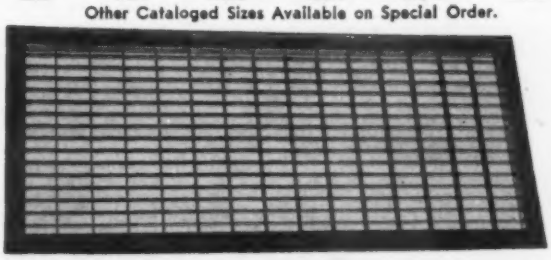
Other Sizes Available

No. 400 TRUSSTEEL FACE

Recommended. Standardized Sizes.

4x14	6x14	8x24	10x24	12x24	14x24
6x10	6x30	8x30	10x30	12x30	14x30
6x12	8x14	10x12	12x14	14x16	18x30
					20x30

Other Cataloged Sizes Available on Special Order.



No. 249 AIR-CONDITIONING REGISTER

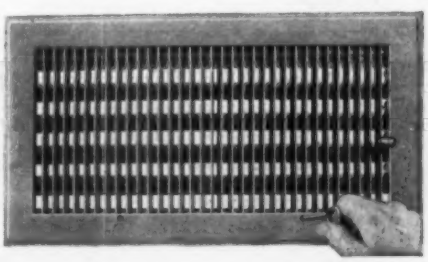
(Adjustable Bar.) Recommended. Standardized Sizes. Registers (Multi-Valve).

10x6
12x6
14x6

Other Sizes Available

10x6
12x6
14x6
24x6
30x6

Other Sizes Available for Special Contracts.



Write for Current Catalogs. New No. 46 Catalog will be ready for mailing soon.

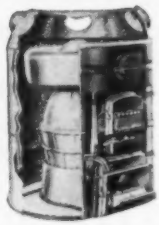
UNITED STATES REGISTER COMPANY BATTLE CREEK, MICHIGAN

GAS OIL COAL

Mueller Series G-90 Gas-Fired Gravity Furnace — Highly efficient up-draft design. Round or square casing.

Mueller Series CVP All-Cast-Iron Gas-Fired Winter Air Conditioner — Compact cabinet for utility room or basement.

Mueller Series 50 Oil-Fired Winter Air Conditioning Furnace — Small size with either vaporizing or pressure atomizing burner. Two larger sizes with pressure burner only.



Mueller Coal-Fired Cast-iron Furnace — Cast iron, gravity type.

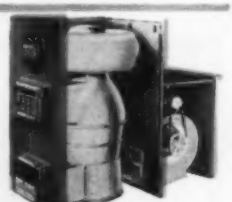
Mueller All-Cast-Iron Coal-Fired Winter Air Conditioner — All parts completely enclosed in one cabinet.

Mueller Series SHP Steel Gas-Fired Winter Air Conditioner — Attractive, compact cabinet type for utility room or basement.

Mueller EPS Gas-Fired Winter Air Conditioning Furnace — Sectional type forced-air units. For residential usage.

Mueller Series OVP Vertical Oil-Fired Winter Air Conditioner — Equipped with Mueller vaporizing Burner. Burner and controls enclosed.

Mueller WG-42 All-Cast-Iron Coal-Fired Gravity Furnace — Capacity 42,000 Btu output at register. Standard return flue radiator.



Mueller WR-72 Coal-Fired Winter Air Conditioner — Capacity 72,000 Btu output at bonnet. All cast iron. Standard return flue radiator.

Mueller Type 20 Gas-Fired Boiler — Steam, hot water, or vapor heating. For larger residences, commercial and industrial buildings.

Mueller Types 10 (shown) and 11 Gas-Fired Boilers — for steam, hot water, or vapor. For residences and small commercial installations.

Mueller Series OHP Horizontal Oil-Fired Winter Air Conditioner — Equipped with Mueller Vaporizing Burner. Burner and controls exposed.

Mueller Double-Radiator Furnace — Gravity type. Tubular design — heavy cast-iron construction.

Mueller Double-Radiator Furnace — forced-air type — Tubular design and heavy cast-iron construction.

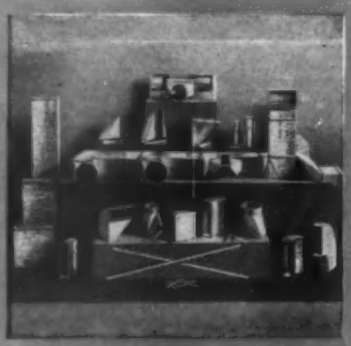
Mueller Gas-Fired Unit Heaters — Space-heating unit for factories, warehouses, hangars, shops.

Mueller Stoker-Fired Furnace — forced-air type. No fly ash accumulations, integral clinker chute.

Mueller Coal-Fired Steel Furnace — Gravity type.

Mueller Steel Coal-Fired Winter Air Conditioner — All parts completely enclosed in one cabinet.

Mueller Blowers — for residential, commercial and industrial applications — heating, ventilating, air conditioning, and processing installations.



Mueller Furnace Pipe, Ducts, and Fittings — Single and double tin and galvanized iron gravity fittings, Pre-Fab forced-air duct systems (including Mueller patented Take-Off Fittings)

MUELLER

Climatrol

Reg. U. S. Pat. Off.

has what it takes to make you a "Comfort Merchant"

1. "Climate Control". . . the sound basic principle that assures you of delivering True Indoor Comfort, and winning the good will of satisfied customers.

2. The complete Climatrol line . . . enabling you to meet every requirement with the *right* equipment for the job.

3. The nationally-known Climatrol name . . . backed by national advertising and an 89-year performance record.

This is the right combination for successful installations — and for successful selling, when supply begins to catch up with demand and competition again becomes keen. It pays to tie up with Mueller for the long pull. Be a "comfort merchant," with Climatrol. . . . *Write for bulletins and complete information.*

D-57

L. J. MUELLER FURNACE CO.

2010 W. OKLAHOMA AVENUE MILWAUKEE 7, WISCONSIN

Galvanized Beth-Cu-Loy Sheets

Rust plays no favorites—it's a factor that *you,* and your customers, have to take into account, in ductwork, piping, roofing and similar installations.

Here's an effective way to stall off the ravages of rust at low cost. Use Galvanized Beth-Cu-Loy steel sheets. The tight, pure zinc coating gives long-lasting protection. And when the coating has lived out its normal life, the copper-bearing steel base is good for additional long service. For tests have shown that Beth-Cu-Loy sheets resist rust two to three times as long as ordinary steels or irons.

Use Galvanized Beth-Cu-Loy sheets for exposed installations—or those subject to moisture—or those inaccessible for ordinary maintenance. You'll find that their slight extra cost is repaid in longer service.

★ BETHLEHEM STEEL ★

whether you SELL-

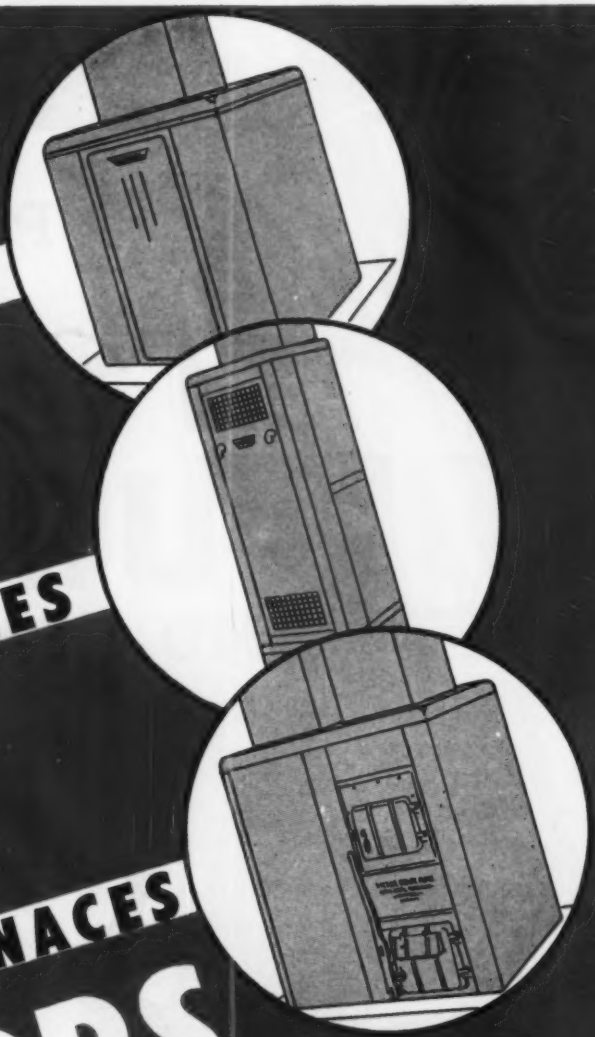
Oil FURNACES

Gas FURNACES

Coal FURNACES

VICTORS

SELL The Furnaces with
HEAT RADIATING FINS



...Heat Radiating FINS . . . plus a furnace line unsurpassed in ... pleasing, recognized quality and customer satisfaction, assure you ... of more and easier installations (more profit) in '46. DEALERS ... Write us NOW. The complete VICTOR line with its full Engineering ... Department cooperation will interest you.

FURNACES · OIL BURNERS · GAS BURNERS · STOKERS · BLOWERS · ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR Quality Furnaces Since 1890

1326 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

FOR MORE DISTINCTIVE AND P
REPRESENTATION IN WARM AIR H

Certified

PERMA-WELD

Warm Air FURNACES AND HEATING EQUIPMENT

Complete line representation is now being offered to dealers who desire to "Grow Big" in the warm air heating field. New and improved equipment is being added to the Certified line of quality heating units that will provide for compelte servicing of all warm air heating requirements.

Expansion of this already highly recognized line offers many advantages to dealers not only to meet present demands for better merchandise but to also build toward a more profitable future.

Write now for details and literature covering Certified complete line representation.

THE Complete LINE

WARM AIR HEATING EQUIPMENT FOR EVERY

D PROFITABLE
R HEATING!

"Grow Big"

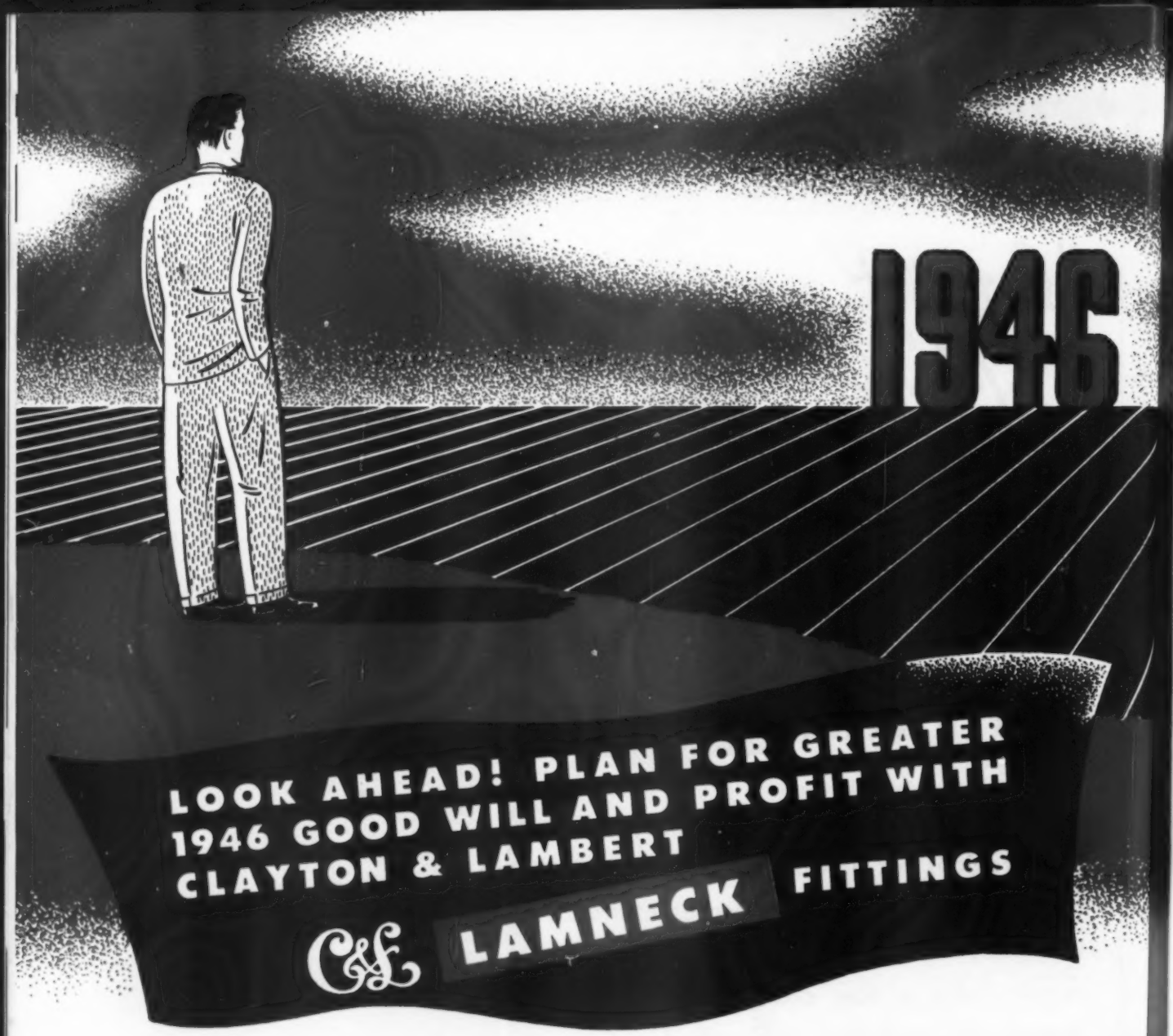
WITH THE
CERTIFIED
COMPLETE LINE OF
WARM AIR
HEATING
EQUIPMENT

Present demands of warm air heating services provides for greatly increased expansion through full line dealer representation. Complete service to all warm air heating requirements is now available to dealers through this quality line of Certified heating equipment.

Certified

WRITE FOR INFORMATION

STAINLESS & STEEL
PRODUCTS COMPANY
CERTIFIED HEATING DIVISION
1000 BERRY AVE. • ST. PAUL 4, MINN.



LOOK AHEAD! PLAN FOR GREATER 1946 GOOD WILL AND PROFIT WITH CLAYTON & LAMBERT

C&L LAMNECK FITTINGS

Start 1946 *right;* with your fittings concentrated on fast-moving items—the simplified line of Clayton & Lambert LAMNECK Fittings Why crowd warehouse space and tie up capital in slow-moving goods for which there is little demand when fittings are now available.

Adoption by Clayton & Lambert of Simplified Practice Program R-207-45, sponsored by the U. S. Department of Commerce and the National Bureau of Standards, enables you to offer a streamlined service designed to build and hold business. The new Clayton & Lambert schedule eliminates hundreds of sizes and styles seldom used for good warm air heating installations.

Now is the time to strip away non-productive costs and meet a keen 1946 with everything in your favor. Write for your copy of our new Simplified Catalog, available the first of the new year. Start 1946 right!

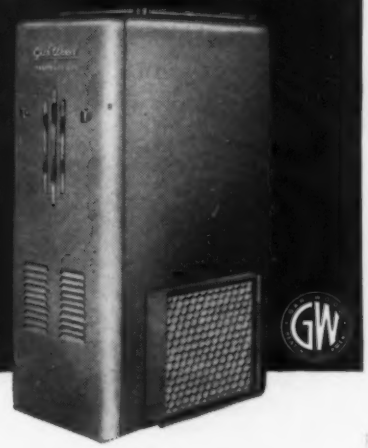
C&L CLAYTON & LAMBERT MFG. CO.
Middletown Division, Middletown, Ohio

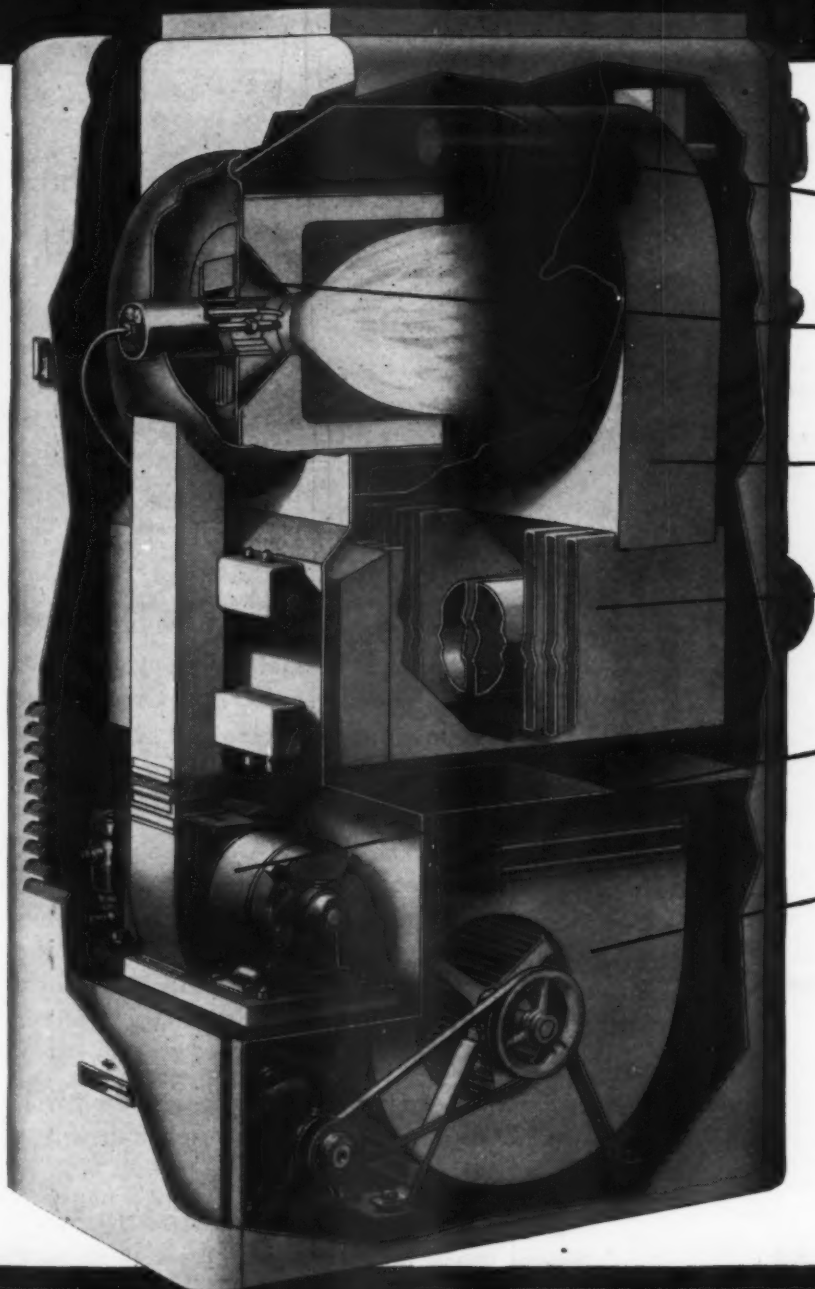
LAMNECK FITTINGS WILL ALWAYS BE TOPS!

LOOK TO THE NEW OIL-FIRED

Gar Wood TEMPERED-AIRE

for the Outstanding Sales Features





The quick-acting FLASH HUMIDIFIER is designed to supply adequate humidity under present day short firing cycle conditions.

The FIRING ASSEMBLY is integrally built and provides air and oil properly intermingled and rotated for perfect combustion.

The FIREBOX is tear-drop shaped to remove the peak from the high temperature zone. This, plus sturdy construction, gives long life.

The ECONOMIZER uses the counterflow principle by passing the combustion gases through long, thin tubes between which the cold air must pass.

The rubber mounted POWER UNIT supplies air under pressure to the burner windbox and also maintains a controlled oil pressure in the burner fuel nozzle.

The silent AIR BLOWER is designed to deliver a generous quantity of air against the friction of the duct system, with the motor drawing a minimum of wattage.

This advertisement describes postwar equipment which is not now available. It does not constitute an offer to sell or deliver and no suggestion is made that orders be solicited. This notice will cease to apply when ceiling prices have been established by the O.P.A.

TO BE ANNOUNCED SOON: Gar Wood GAS-FIRED Tempered-Aire featuring the new CAST IRON, high efficiency heat exchanger.

GAR WOOD INDUSTRIES, INC.

HEATING DIVISION • DETROIT 11, MICHIGAN

Canadian Distributors: Engineering Industries, Ltd., 282 Dupont St., Toronto, Ont.

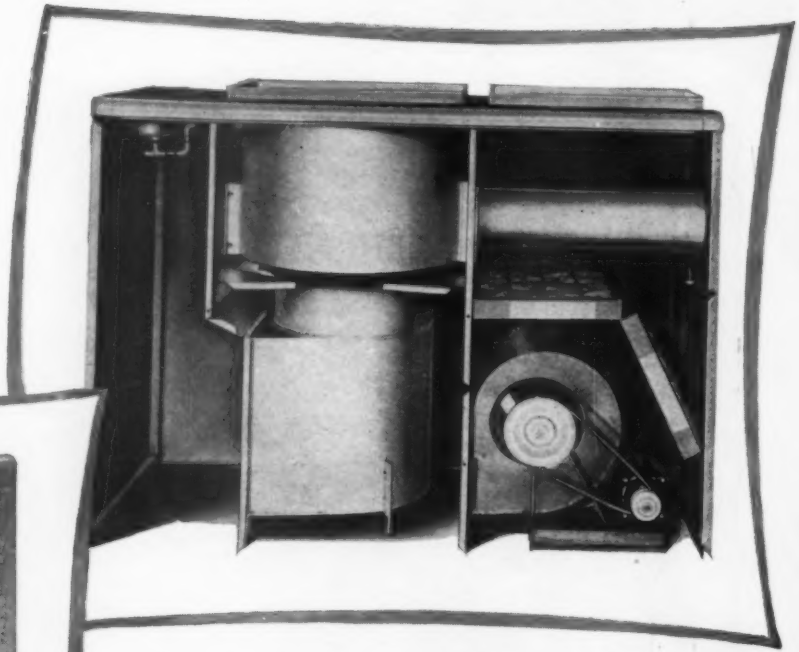
HOISTS and BODIES . . . WINCHES and CRANES . . . TANKS . . . ROAD MACHINERY . . . MOTOR BOATS

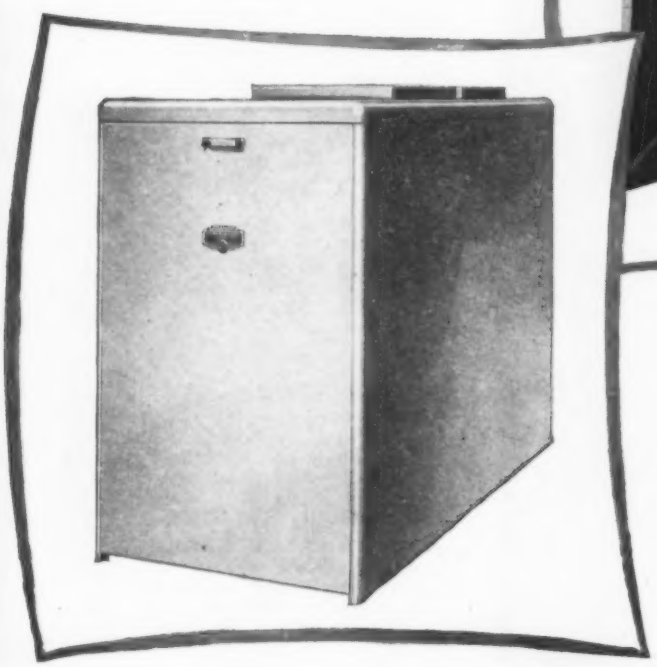
LOW-COST HEAT *for low-cost Homes*

FITZGIBBONS
DIRECTAIRE CONDITIONER

Designed for buyers who demand all the comfort of warmed, humidified, filtered and circulated air, in a unit that has beauty in appearance and finish, quietness in operation, and typically Fitzgibbons fuel saving. Welded steel construction, easy cleaning, operates with any good oil or gas burner.

Available soon in sizes 65,000—80,000—100,000—and 125,000 B.t.u. and greater ranges—from 150,000 to 600,000 B.t.u.





Housing plans for "budget-conscious" builders and owners are being readied now. Great developments of low and moderate cost housing are projected. Construction starts, in many cases, just as soon as materials become available.

Fitzgibbons knows what the potential owners of these homes will want in warm air conditioned comfort. This will be it—the Fitzgibbons Directaire. It will be built and priced for the moderate sized home and will offer the finest in automatic winter air conditioning features and fuel saving standards.

Planning for future demands is a habit with Fitzgibbons. It's the name to watch in the warm air conditioning field.

60TH YEAR

Fitzgibbons Boiler Company, Inc.

General Offices: 101 Park Avenue, New York 17, N. Y.
Manufactured at: Oswego, N. Y.
SALES BRANCHES IN PRINCIPAL CITIES

FITZGIBBONS

THE NAME THAT MEANS *COMFORT* IN THE HOMES OF AMERICA

WHITNEY-JENSEN TOOLS

BENDING BRAKES. The Whitney-Jensen combination roller bearing bending brakes (shown) represent a modern departure from the old conventional hand brake design. All standard sizes from 4' to 10' available. Also available (not shown) are 18 gauge and "air conditioning" models.

No. 5 JR. METAL HAND PUNCH. The Whitney-Jensen No. 5 Jr. metal hand punch is powerful, light in weight, and very easy to use. Capacity ¼" hole through 16 gauge mild steel, depth of throat 2", furnished in either metal or paper box.

Nos. 129 and 130 DEEP THROAT POWER PUNCH PRESSES. The Whitney-Jensen No. 129 and 130 Deep Throat Power Punch Presses have these distinctive features: high speed, deep throats, all steel welded frames, inexpensive auxiliary attachments and various punches and dies from stock. Capacity, 10 tons. Throat depths, 12" and 18".

Nos. 7, 7½, 8-IMPERIAL ROLLER BEARING PUNCHES. General-purpose lever-action punches of widely proved serviceability. Will punch and strip positively inside 90°. Punches and dies can be changed quickly. There is no lever to become disengaged by moving too far in either direction. Three sizes, with capacities of ¼" hole in ⅛", 9/16", and ¼" mild steel respectively. Three punches and dies furnished.

Nos. 1828, 1829, 1858, 1868 DEEP THROAT LEVER PUNCHES. A versatile machine suitable for a wide variety of work. Made in 7", 10", 18" and 24" throat depths. All-steel-welded frame and stand. Powerful geared action. Capacity, 7½ tons. Throat height, 6", die space 3¼". Standard equipment includes depth and side gauges, punch holder, die adaptors, die shoe, and one punch and die.

No. 20 BALL BEARING PUNCH. A portable tool of universal use. It weighs only 18 lbs. yet easily develops 39,500 lbs. punching pressure because of screw press action with ball bearings in the race. A convenient base, shown, can be used to set this tool up on a bench or in a permanent position. Capacity, ½" hole in ½" mild steel, throat depth 2¼", throat height 1⅜". One punch and die furnished, ratchet handle available.

Nos. 28, 29, 58, 68 DEEP THROAT TOGGLE ACTION FOOT PRESSES. Deep throats and powerful punching action permits handling a wide variety of work including pieces previously beyond the scope of similar equipment. Made in four popular throat depths—7", 10", 18", 24". Capacity, 5 tons or 2" hole in 16 ga. mild steel. Operators often handle 100 pieces a minute or better. Throat height 6¾", length of stroke 1", stroke adjustment ¾". Standard equipment includes depth and side gauges, punch holders, die adaptor, die shoe, and one punch and die set.

No. 10 BALL BEARING PUNCH. The No. 10 is the smallest of a "family" of Whitney-JENSEN punches (Nos. 10, 11, 12, 20, 24, 25, 26, 27, 40) famous for tremendous punching power with very light weight. Because of portability and power combined, these punches will pay for themselves quickly in time and money saved even on one small job. No. 10 has a capacity of ⅜" hole in ¼" mild steel and weighs 9½ lbs. Throat depth is 1⅝", throat height ⅞". One punch and die furnished.

No. 72 SERIES POWER SQUARING SHEARS. Features of Whitney-JENSEN Power Squaring Shears include flywheel and motor enclosed between housings, housings made of steel plate, high speed for production work, and simplified blade adjustment. Available in four sizes—36-in. and 42-in. width, 16 ga. capacity, in 42-in. width, 14 ga. capacity, and in 60-in. width, 12 ga. capacity. Efficient machines for jobbing or production work.

No. 247 18-INCH PRESS BRAKE. This small-sized press brake will aid in cost reduction where there are quantities of small formings being done in large presses. The frame is of welded steel construction, workmanship of the highest quality, the operation simple, and maintenance reduced to a minimum. Specifications include 1" length of stroke, 1" lower beam adjustment, 11½" throat height, 6¼" throat depth, speed 47 strokes per minute. Capacity is 14 ga. mild steel over ⅞" 90° V-die, or 4½ tons. Ram and die shoes take standard ½" tongues.

Write for new Whitney-JENSEN
Catalog No. 16-45 ready soon.

WHITNEY METAL TOOL COMPANY

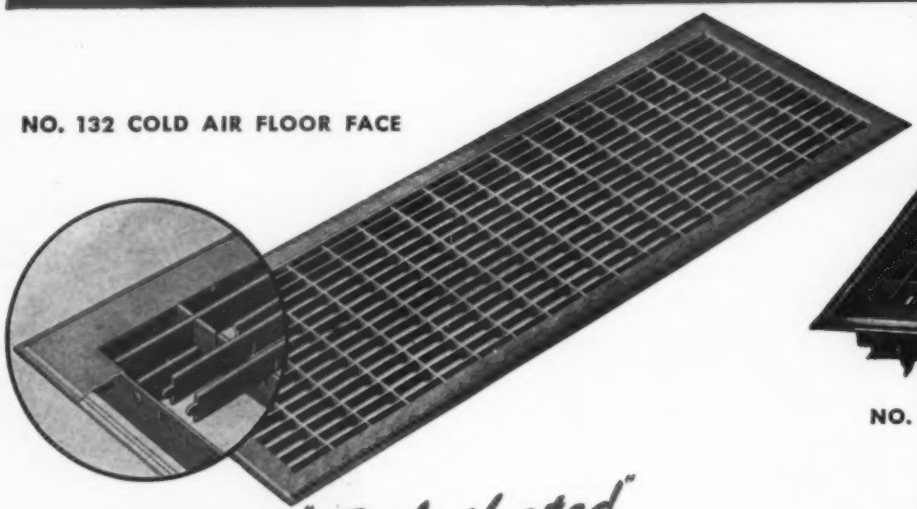
3033 EC[illegible] STREET ROCKFORD, ILLINOIS

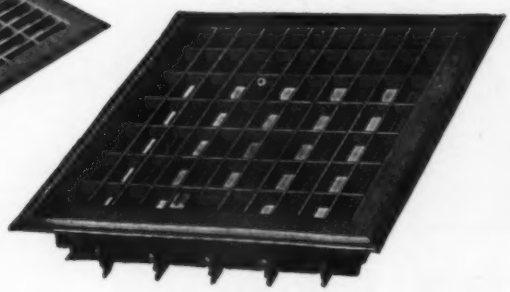
INDEPENDENT "Fabrikated" FLOOR FACES AND REGISTERS

(REG. U. S. PAT. OFFICE)

★ Independent "Fabrikated" construction is applied also to air conditioning registers and grilles. Each grille bar may be individually adjusted to direct the airflow as desired. Further details given in catalog 41AC.

NO. 132 COLD AIR FLOOR FACE

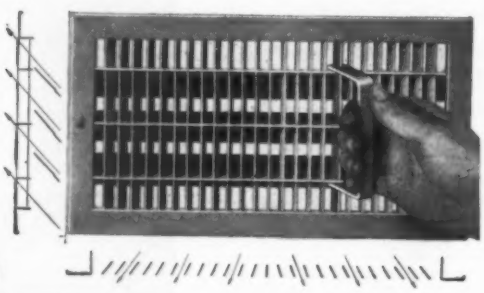




NO. 32 FLOOR REGISTER

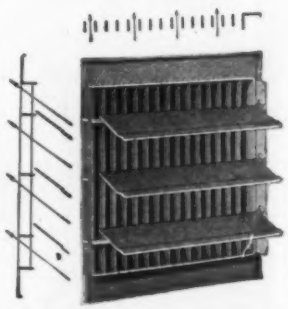
INDEPENDENT "Fabrikated" WALL GRILLES WITH DEFLECTING VANES

Style 321A Grille with Deflecting Vanes



ALWAYS LEADING—ALWAYS PROGRESSING

★ With vertical grille bars and horizontal deflecting vanes. The grille bars may be individually adjusted to direct air flows to right or left; and the vanes are made individually adjustable to deflect air flows up or down.



REAR VIEW SHOWING ADJUSTABLE DEFLECTING VANES

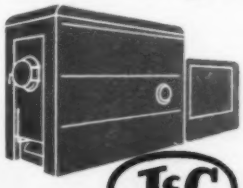
THE INDEPENDENT REGISTER CO.

3747 EAST 93RD STREET, CLEVELAND, OHIO

WORK WELL DONE

SINCE "EIGHTY-ONE"

As we enter our 65th year of manufacture we thank our many customers and good friends everywhere who have favored us with their patronage and thus made possible our steady growth. Such progressive expansion of our manufacturing facilities is proof that our intelligent engineering, expert workmanship, and honest manufacturing have won for J & C furnaces and other J & C products wide-spread acceptance among builders, architects, and other members of the building trades. To them we pledge continued strict adherence to our policy of producing only quality furnaces, fairly priced.



J&C **JACKSON & CHURCH COMPANY**

ESTABLISHED 1881 • SAGINAW, MICHIGAN

★ *When you buy hand tools ask for* ★

W. A. WHITNEY

No. 1 Punch

Capacity ⅜" hole through ¼" iron

Length 34". Wt. 23 lbs. Depth of throat 1⅞".

Punches and dies ⅛" to 9/16" by 1/64"

No. 2 Punch

Capacity 5/16" hole through ¼" iron

Length 23". Wt. 14 lbs. Depth of throat 1-11/16"

Punches and dies 3/32" to ½" by 1/64"

Channel Iron Punch

(A companion to No. 2 Punch)

Capacity ¼" hole through ¼" iron

Length 23". Wt. 17 lbs. Depth of throat 1⅞"

Punches and dies 3/32" to ½" by 1/64"

HERE'S WHY—

There's a Whitney tool for *every* job, and *every* tool has these 6 Important Features—

- *Simple Design*
- *Sturdy construction for hardest kind of service*
- *Well distributed weight, making tool easy to handle*
- *Drop forgings of high grade alloy steel on all main parts*
- *Heat treated wearing parts*
- *Guarantee against defect in material and workmanship*

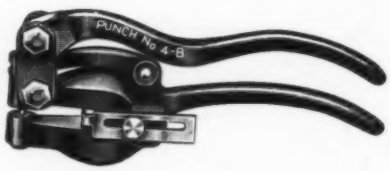
Extra punches and dies are of A-1 grade tool steel, expertly heat treated and tempered

The Registered Trade Mark

which appears on all W. A. Whitney tools and extra punches and dies is the manufacturer's promise that they will give entire satisfaction and the utmost in service.

Illustrated are a few Whitney Hand Lever Punches. Write for our catalog giving full information on all sizes and styles, or ask your jobber.

Buy W. A. Whitney tools from your jobber



No. 4-B Tinner's Punch

Capacity ¼" hole through 16 gauge iron

Length 8½". Wt. 3 lbs. Depth of throat 2"

Punches and dies 1/16" to 9"32" by 1/64"

No. 6

Skylight, Ventilating and Tank Flange Punch (Especially adapted for button punching)

Capacity ¼" hole through 3/16" iron

Length 26½". Wt. 10½ lbs. Depth of throat 1¾"

Punches and dies ⅛" to 9/32" by 1/32"

No. 8-B Punch

Capacity ¼" hole through ⅛" iron

Length 18½". Wt. 7½ lbs. Depth of throat 2"

Punches and dies 1/16" to 7/16" by 1/64"

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

No. 92 Bench Punch

(Uses No. 91 punches and dies)

Weight 165 lbs. Depth of throat 10"

No. 91 Bench Punch

Capacity ½" hole through ¼" iron
¾" hole through 3/16" iron
2" hole through ⅛" iron

Weight 82 lbs. Depth of throat 5"

Punches and dies ⅛" to 2"

Channel Iron

2½" Flange x ¼" Web

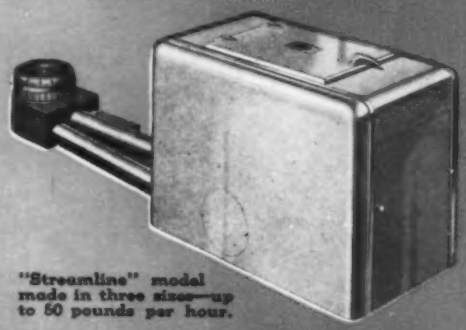
Angle Iron

2½ x 2½ x ¼"

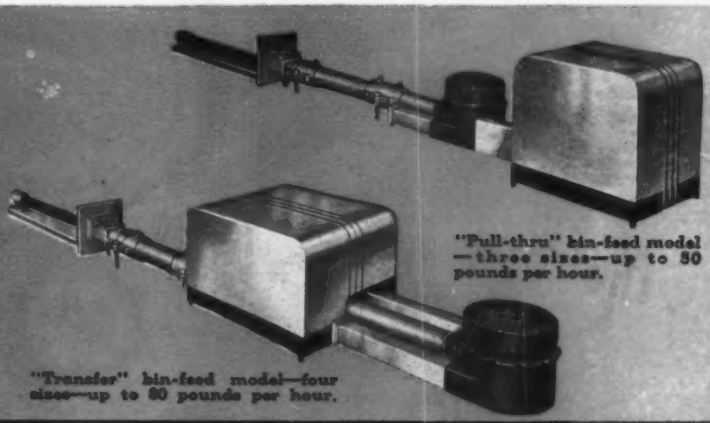
LINE UP WITH ECON-O-COL

Time-tested for Performance • *Sales-tested* for Profits!

DOMESTIC



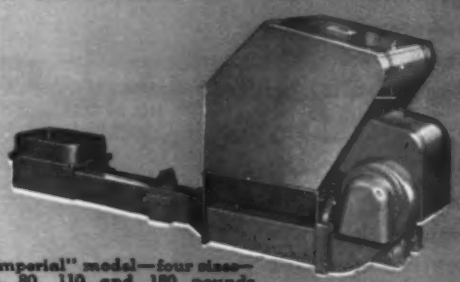
"Streamline" model made in three sizes—up to 50 pounds per hour.



"Transfer" bin-feed model—four sizes—up to 80 pounds per hour.

"Pull-thru" bin-feed model—three sizes—up to 50 pounds per hour.

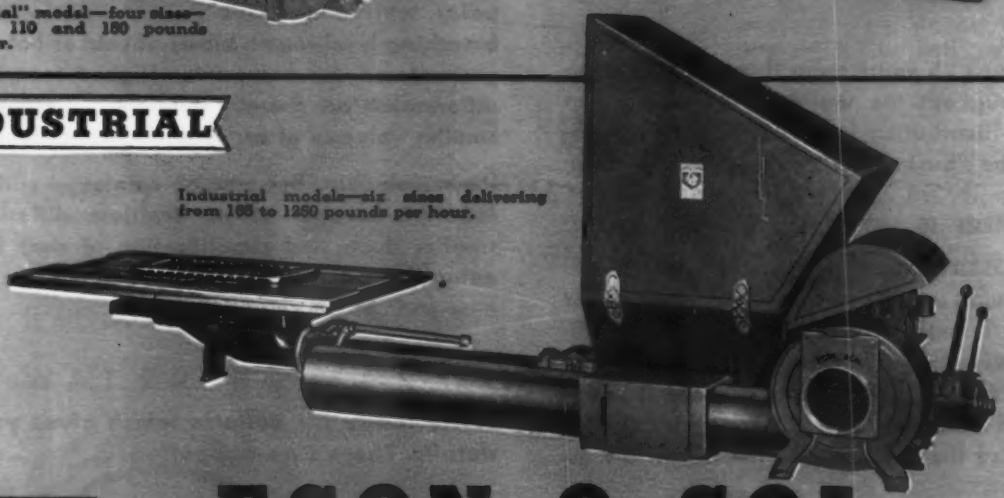
COMMERCIAL



"Imperial" model—four sizes—60, 80, 110 and 150 pounds per hour.

"G" Series—five models delivering from 128 to 860 pounds per hour.

INDUSTRIAL



Industrial models—six sizes delivering from 166 to 1250 pounds per hour.

ECON-O-COL

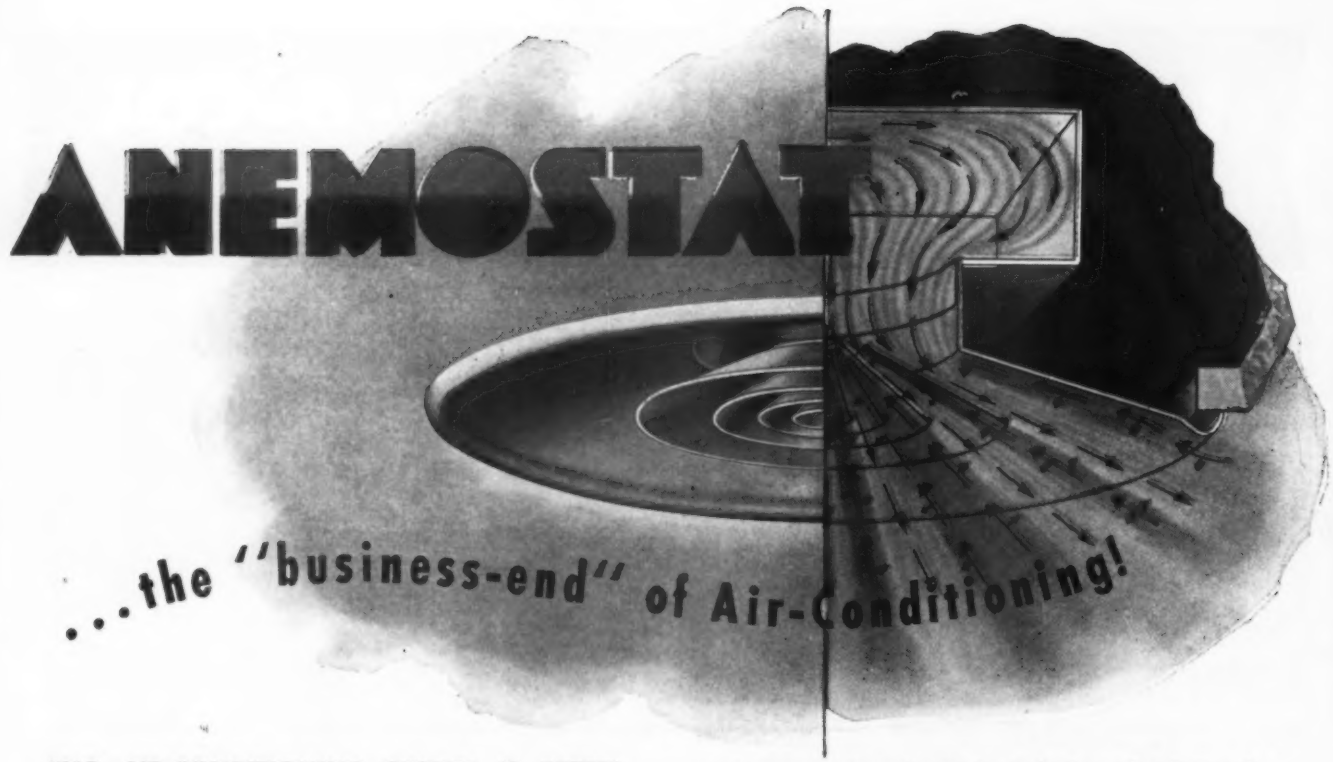
ECON-O-COL Automatic COAL BURNER

THE SHIELD OF QUALITY

The "Stronghearted" Stoker

MANUFACTURED BY COTTA TRANSMISSION CORPORATION ★ ROCKFORD, ILLINOIS

ANEMOSTAT



. . . the "business-end" of Air-Conditioning!

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR DISTRIBUTION".

When large volumes of conditioned air are forced into a room, drafts occur—unless ANEMOSTATS are used. The patented ANEMOSTAT is an air-diffusing device without moving parts. It is easily installed on any air-conditioning, ventilating, or hot-air heating system. It assures *draftless* distribution of any volume of cooled or heated air at any velocity.

During the last 25 years more than 50,000 installations throughout the world have proven that *efficient* air-distribution is synonymous with ANEMOSTAT—the "business-end" of air-conditioning.

HERE IS HOW IT WORKS

The ANEMOSTAT diffuser creates a series of air currents flowing away from the device in planes or blankets at scientifically correct angles. In addition, the ANEMOSTAT creates a series of counter-currents of room-air which are siphoned into the diffuser and mixed with the incoming air streams. Thus, 35% of the room air is mixed with the incoming cooled or heated air before the latter is discharged into the room. This action is the only true *"Aspiration"—and it is exclusive with ANEMOSTAT!* No drafts!

This air-mixing action *within* the ANEMOSTAT establishes the required room-temperature at a point well above the breathing level—so no blasts of cold or hot air are encountered by occupants. Higher temperature differentials are thereby possible . . . resulting in smaller volumes of air requiring conditioning.

Higher air-velocities may be employed with ANEMOSTAT because of its draftless diffusion, so smaller ducts and simplification of duct layouts naturally follow. Yes, ANEMOSTAT is the "business-end" of air conditioning!

•

Write today for Bulletin which gives you full details. There's no obligation!

Veteran-ize your personnel!
Many discharged war veterans received valuable technical and specialized training. Always consider veterans when you employ. They did their share —now let's all do ours!

ANEMOSTAT

ANEMOSTAT CORPORATION OF AMERICA
10 East 39th Street, New York 16, N. Y.

if IT'S A QUESTION OF WHICH LINE TO SELL...

Look at it this way . . . Naturally you should consider the usual matters of quality, dependability, performance and profit-margin — but *don't overlook the value of public opinion!* If a line of merchandise has the wholehearted approval of the buying public there is no more positive assurance that the other qualities are there in abundance.

Rudy's reputation for owner-approval is unsurpassed — it has stood the test of nearly half a century of exposure to public opinion, and has grown in favor through the years.

The Rudy line is *your* answer to a successful business — let us tell you about it.

RUDY

FORCED AIR HEATING EQUIPMENT • COAL FIRED • GAS FIRED • OIL FIRED

GRAVITY HEATING EQUIPMENT • COAL FIRED • GAS FIRED • OIL FIRED

BLOWERS • OIL BURNERS • HUMIDIFIERS • STOKERS

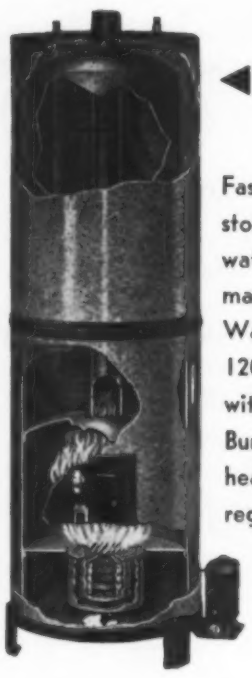
WATER HEATERS • HEATING ACCESSORIES

RUDY FURNACE COMPANY • DOWAGIAC, MICH.

AUTOMATIC OIL BURNING FURNACES

Monogram
WINTER AIR CONDITIONER ▶ ▶ ▶

Graceful, modern lines combined with superior performance make this a most popular item. In three models: No. 125, 90,000 B.t.u.; No. 150, 120,000 B.t.u.; and No. 250, 150,000 B.t.u. Front and rear panels permit easy access to inner chambers. Double baffle in heating drum; Automatic Oil-Air Control set; Automatic Humidifier; Combination Limit Control and Blower Switch and Automatic Draft Regulator is standard equipment.



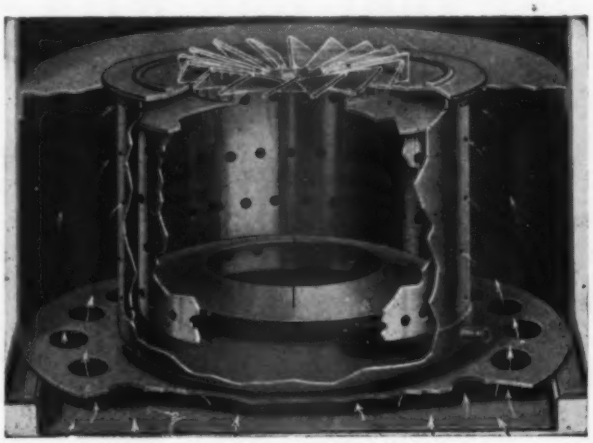
Monogram
◀ ◀ AUTOMATIC OIL BURNING WATER HEATERS ◀ ◀

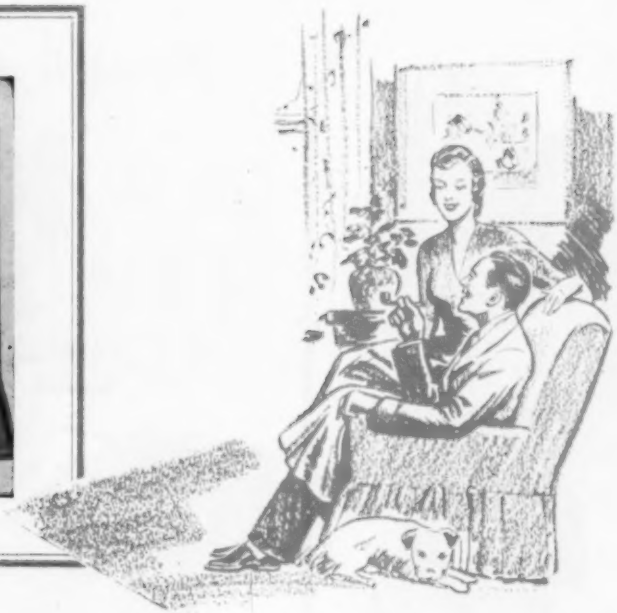
Fast recovery rates plus extra large galvanized storage tank assures an abundance of hot water for the largest families. It's 100% automatic. Aquastat control has three settings, Warm, Medium, Hot; water temperatures are 120°, 140°, 160° respectively. Equipped with a 5-inch MONOGRAM Vaporizing Oil Burner. Complete boiler insulation reduces heat loss to a minimum. Automatic draft regulator. Outer cabinet in green ripple and black trim. Drop door gives easy access to burner parts. Outside thermometer.

WRITE TODAY FOR MORE INFORMATION

The QUINCY STOVE MFG. CO.

QUINCY, ILLINOIS





Monogram

TURBULENT FLAME VAPORIZING BURNERS

The MONOGRAM Burner is your "lever" to post-war heating profits. More and more wartime critical materials are being released with a resultant upswing in new home installations and badly needed furnace repair and replacement work. MONOGRAM cuts you in on this tremendous market with a burner that is undoubtedly the most important improvement in oil burner construction in many years. The MONOGRAM Burner has no moving parts—is clean, quiet and trouble-free—needs no frequent cleaning or servicing. It will operate efficiently on low fire with .02 draft, while the mechanical draft supplied on high-fire is sufficient to allow the burner to maintain MONOGRAM's high standard of efficiency at all times.

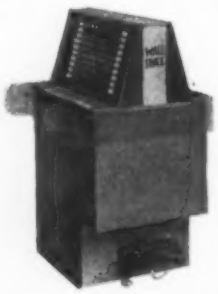
This excellent performance is the result of the exclusive engineering design of the MONOGRAM Burner which converts oil to gas and mixes the gas with air before combustion, producing a flame that is hotter, cleaner and more efficient than usual.

MONOGRAM Burners have established a reputation for performance and reliability which will assist you to better profits and more satisfied customers. Write today for full information on the complete MONOGRAM line.

MONOGRAM Produces
More Heat from Less Oil

★ ★ ★

The QUINCY STOVE MFG. CO.
QUINCY, ILLINOIS



FLOOR FURNACES

UTILITY HI-BOY

FORCED AIR FURNACES

WATER HEATERS

FOR CONVERTING WOOD AND COAL RANGES

Round out your line with—

KRESKY

OIL HEAT

No matter what line of burners or heating equipment you handle it will pay you to investigate KRESKY to round out your line. Unique among oil burners KRESKY burns a long flame with mechanical air induction, providing quick, clean, intensive heat at low cost. Simple in design, trouble-free in operation. A 35 year record of dependability.

The line includes:

KRESKY FLOOR FURNACES: The original and still the only forced air, oil-fired floor furnace bearing the Underwriters Label.

KRESKY RANGE BURNERS: for converting wood or coal to oil. KRESKY burners have been adopted as standard equipment by most leading stove makers.

KRESKY HI-BOY UTILITY FURNACE: for heating the home from garage or utility room.

KRESKY JUNIOR FURNACE: forced air furnace for small homes.

KRESKY water heaters and space heaters round out the line.

Write for details of KRESKY attractive Dealer Merchandising Plan.

KRESKY

MANUFACTURING CO.

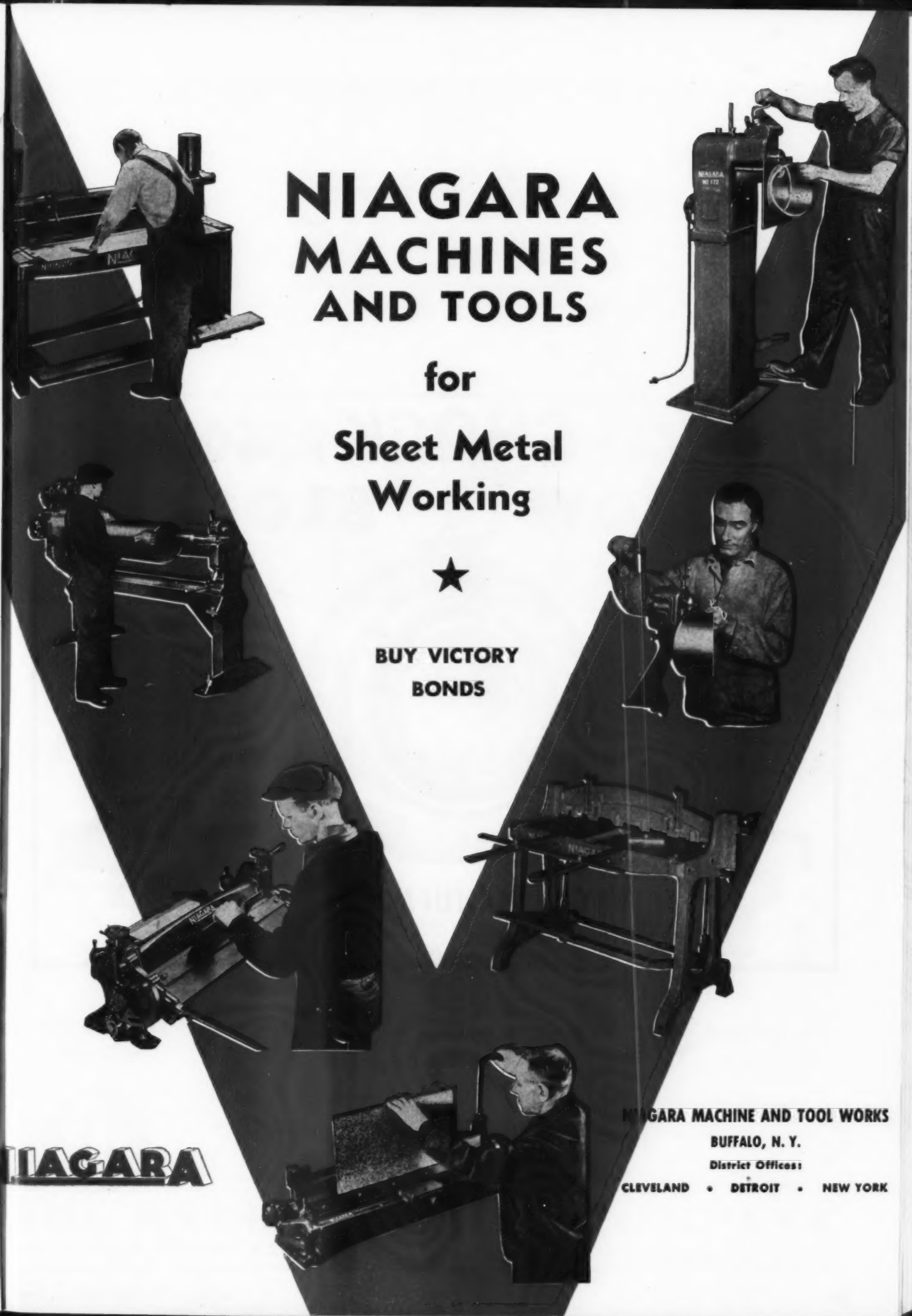
Pioneers in Oil Burning Equipment Since 1910

PETALUMA CALIFORNIA

ARMY E NAVY
KRESKY OIL BURNERS
UNSURPASSED
PETALUMA CALIF. U.S.A.

Listed by Underwriters' Laboratories, Inc., to Burn No. 3 Oil (Diesel) or lighter

OVER 75,000 KRESKY OIL BURNERS INSTALLED


NIAGARA
MACHINES
AND TOOLS
for
Sheet Metal
Working
★
BUY VICTORY
BONDS
NIAGARA
NIAGARA MACHINE AND TOOL WORKS
BUFFALO, N. Y.
District Offices:
CLEVELAND • DETROIT • NEW YORK

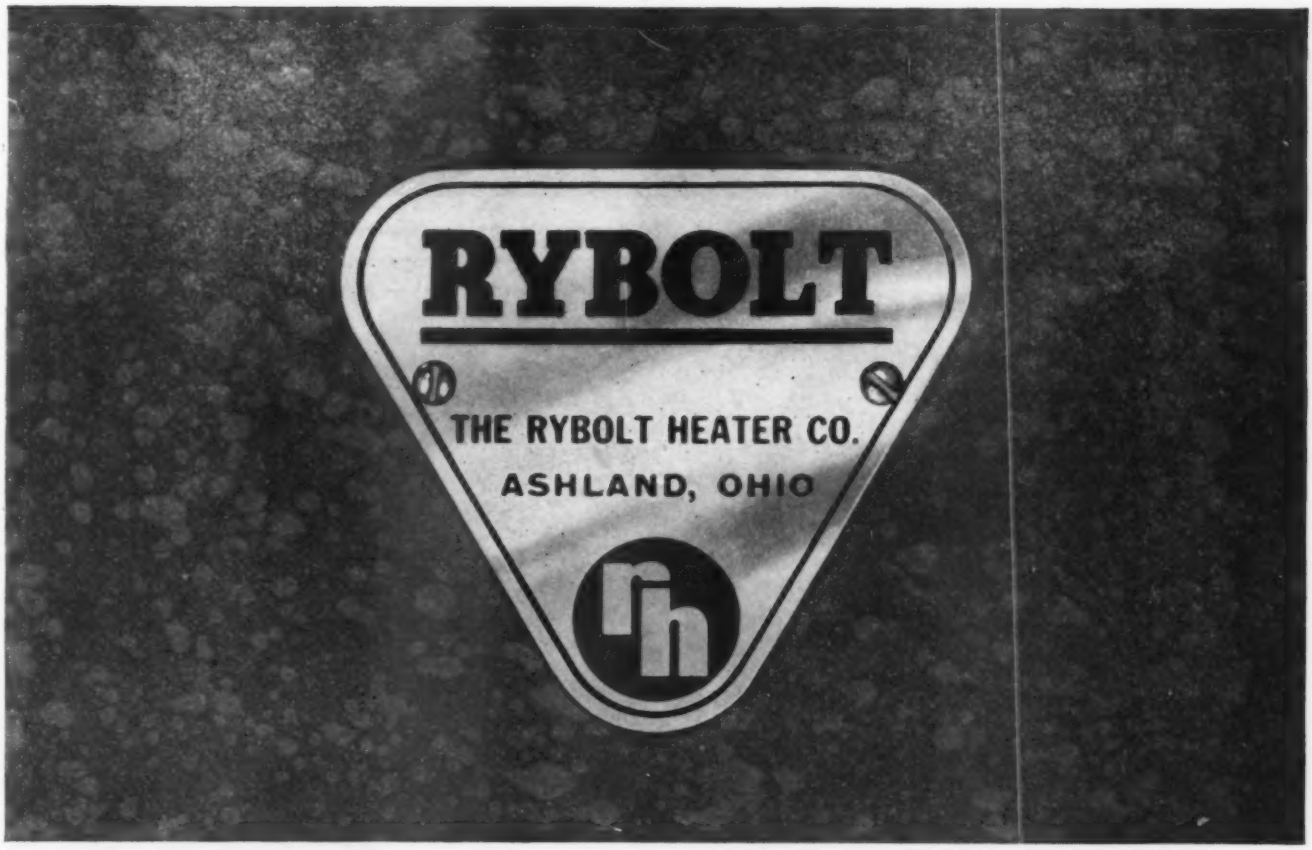
TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Triangle engineers for fans, blowers and other devices requiring silent operation, perfect alignment and self-lubrication.

Preloaded oil-proof cushion built into the bearing.
Ball-and-socket design.
Write for samples and complete information.

TRIANGLE MANUFACTURING CO.

392 DIVISION STREET OSHKOSH, WISCONSIN



YOUR GUARANTEE

of Heating Equipment Quality

The last thing put on a Rybolt heating unit is the name plate. It's the first thing you should look for because it is your guarantee of Rybolt quality, efficiency and dependability.

The Rybolt name plate means that the heating unit has been designed in accordance with the most advanced heating principles. It means that it represents the best that sound engineering and modern manufacturing methods can produce. It means that it has successfully withstood exhaustive tests.

Buy an Extra War Bond

The Rybolt name plate protects your reputation as a reliable dealer by insuring the satisfaction of your customers.

THE RYBOLT HEATER COMPANY

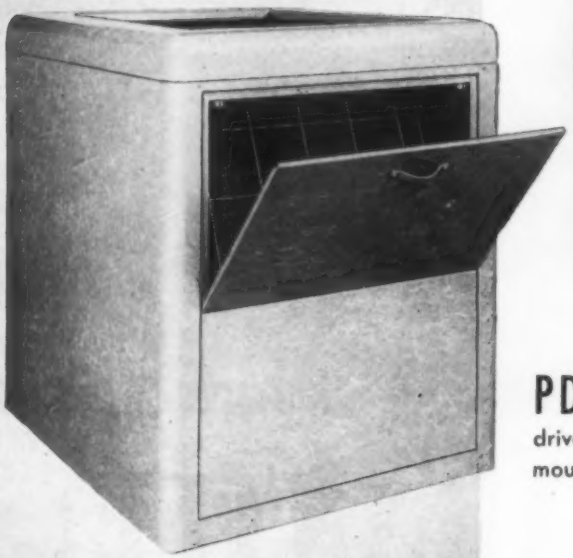
615 MILLER STREET ★ ASHLAND, OHIO

Brundage BLOWERS

MAINTAIN THEIR PRE-WAR QUALITY CONSTRUCTION

BLOWER-FILTER PACKAGE UNITS

200 AND 300 SERIES



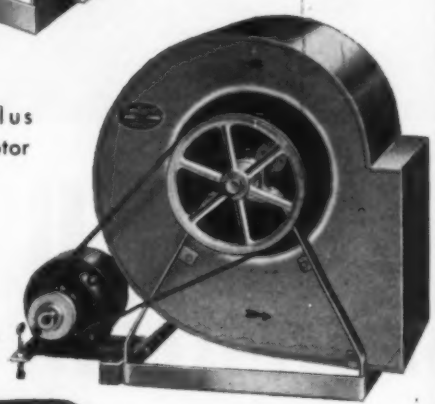
Blower-Filter cabinet . . . beautifully styled, baked enamel finish, die-formed. Shipped knocked down for ease in handling, installation, or storage . . . Easy access to replaceable filters.

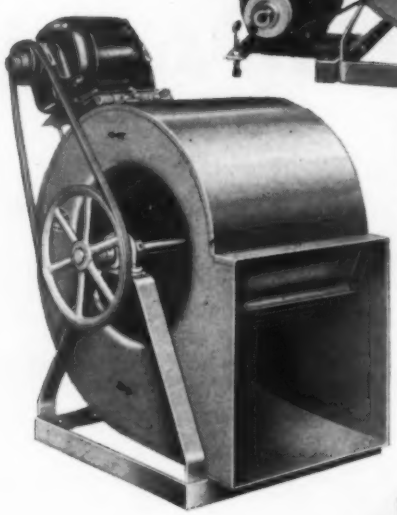
Those who want top performance coupled with economical, quiet operation take advantage of the skilled engineering and master craftsmanship which has made Brundage Blowers a first for one quarter of a century . . . Made in a full complement of sizes . . . *Sales representatives in key areas throughout the country.*

Brundage Blower Assemblies are the nerve center of the blower-filter package unit. These are built in a complete range of sizes to meet manufacturers' needs.

PN Nucleus of an efficient sturdily built series of blower units.

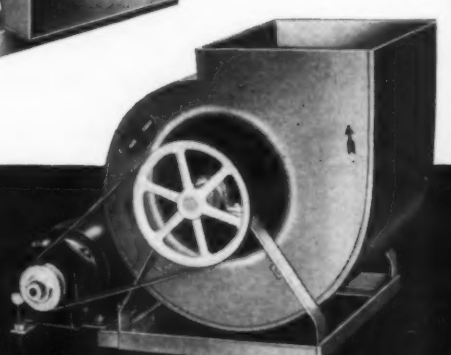
PDRM PN plus drives and rear motor mounting.





PDUM PN plus drives and top motor mounting.

PDRM Upblast Other angle discharge blowers furnished on special order.



THE Brundage COMPANY

BLOWER SPECIALISTS

Since 1919

KALAMAZOO 11, MICHIGAN

You wouldn't buy a truck like this

. . . to do a job like this

"Model 10D10 for 4 to 6 room homes using up to 8 tons of coal per season"

Why install a 30 lb. stoker when a RACINE 10 lb. stoker will do the job? The Racine is the only stoker we know of that burns all the coal fed to it.

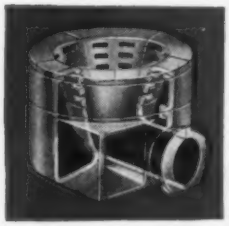
AUTOMATIC *Racine* HEATING

RACINE IS TRULY A MODERN POST WAR STOKER and NOT A PRE-WAR 1935 MODEL WITH A 1946 LABEL.

Check These Engineered Features:

FINGER TIP CONTROL of fuel feed, feeding ounces or pounds as needed to produce heat on a modulating basis, maintaining uniform, even temperatures.

Air line to conveyor housing COOLS coal in lower part of retort, prevents coking and also prevents gas and smoke backing into hopper.



Air Cooled Fire Pot (5 year guarantee on De-Luxe models) burns any grade or size of bituminous stoker coal. Breathes freely, maintaining a glowing fire and healthy fuel bed.

Proof OF TYPICAL 10D10 INSTALLATION

Record for Nov. 1 to Dec. 10, 1945. An 8 room home, average construction with open stairway and exposed all around. Heat supplied to 8 rooms during day and 5 rooms during night. Outside temperatures varied from 12° to 60° with an average of approximately 32°.

Thermostat was set at 74° and thermometer didn't vary more than 1°. **Fuel feed** was set at 5# per hour and at no time was it necessary to increase fuel feed. During coldest days stoker ran approximately 21 hours per 24, or an average of 52 minutes per hour. Coal consumed was 3520# or an average of 3⅔# per hour. Residue was 164# of clinkers. Practically no fly ash.

WHY INSTALL a 30 pound stoker in a home of this size? CLEANLINESS and QUIETNESS are outstanding "Racine" features and FUEL SAVINGS are amazingly high.

DOMESTIC AND SMALL COMMERCIAL MODELS

- **Model 15D10** for 7 to 8 room homes, using from 8 to 10 tons coal per season.
- **Model 20C14** for homes or buildings using from 10 to 15 tons coal per season.
- **Model 30C14** for homes or buildings using from 15 to 20 tons coal per season.
- **Model 60C14** for homes or buildings using from 20 to 35 tons coal per season.

Inquiries are invited from DEALERS who are interested in the heating welfare of the home owner.

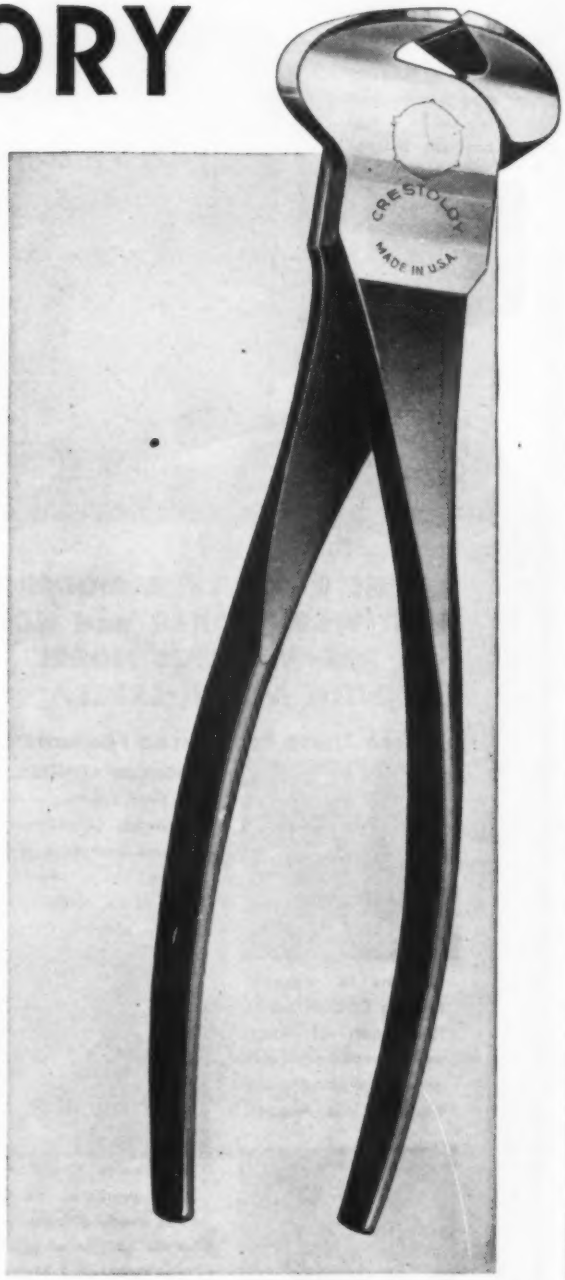
NELSON BROS. and STROM CO.

RACINE WISCONSIN

The "Racine" method of stoker firing is the result of over 15 years of stoker engineering and research.

"CRESTOLOY"

A single word that tells a BIG STORY



The single word—"Crestoloy"—stamped on our pliers tells a big story. It means that each individual tool was tested thoroughly before it was boxed. Thus, Crescent takes the guesswork out of *tool buying* by taking the guesswork out of *tool making*.

Before a die is made, before a forging hammer drops, rigid specifications—based on 40 years experience—are established to specify the material, design and workmanship. Then, after the tools are forged and finished, they are double-check tested to guarantee satisfaction and long life.

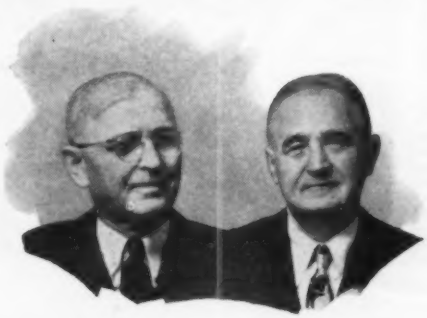
That is the way Crescent guarantees dealer and user satisfaction. That is why the demand for Crescent and Crestoloy tools has reached an all-time high and, why we are working so hard to supply the wants of thousands of hardware dealers.

CRESCENT TOOL COMPANY

Jamestown, N. Y.

"BEST SELLERS" FOR 40 YEARS

100 YEARS *of Service*



Michael and Robert Bolda Celebrate 50th Anniversary as Employees of Detroit Lubricator Company

On October 13, 1945, Michael and Robert Bolda, celebrated their 50th anniversary in the service of Detroit Lubricator Company, rounding out 100 years of service between them, having started with Detroit Lubricator Company in the Fall of 1895.

Mike is superintendent of the foundry, and Bob is foreman of the core room. Their work has been with the foundry for the entire time, and they have seen non-ferrous foundry methods develop from the rule of thumb control and hand labor of 1895, to the modern mechanized operation and exact scientific control of modern instruments as used today.

Mike's first job was mixing core sand. He had to "riddle" (sift) it by hand, and mix in the oil and other ingredients by hand shoveling. Then he had to carry it by hand, in boxes, to the core making benches. In 1902 he was given charge of the core room, and in 1910 was made assistant foundry superintendent. In 1916 he became foundry superintendent and began his work of exact control which has made Detroit Lubricator castings noted for high quality. He did it by making exact records of the best conditions for casting each type of piece—by constant experiment to improve castings.

In the early days such instruments as pyrometers were unknown. Metal temperature had to be judged by color and by "vibration" when a rod was immersed in the ladle of molten metal. Very hot metal will vibrate the rod, cool metal will not. A skilled man can check his eye judgment in this way. "Modern pyrometers are much better, however," Mike says, "because eye judgment at its best can ony come within 10 degrees or so of the correct temperature, and then only under the most favorable conditions."

Careful control of metal temperatures, molding and casting conditions, as well as metal mix, has always been of first importance to Detroit Lubricator Company. Beginning with their early products, pressure and other type lubricators, and continuing through automobile carburetors to the present line of refrigeration and heating valves, their products have always required castings of perfect soundness, impervious under pressure test. When Mike took charge of the foundry, scrap losses were high and too many castings had to be remelted because they were not suitable for use. His control methods have since cut losses to a fraction of what they were.

While Mike was pursuing losses in the foundry proper, Bob was doing similar service in making cores. Cores are baked sand shapes placed in the mold to make hollow places in castings. They are made of various kinds of sand plus some binder such as linseed oil or stale beer (in early days); or these days, scientifically mixed core oil. Making them looks as simple as whipping up mud pies, but foundrymen will tell you they are tricky. They can skyrocket scrap losses if they fail to behave properly when the hot metal flows around them in the mold.

Mike and Bob have found Detroit Lubricator Company a good place to work. So have their sons. Mike has three sons and one daughter living. One son works at Detroit Lubricator Company and the other two are in the armed services. Two of Bob's sons work at Detroit Lubricator Company and two are in the army. Bob also has a daughter.

The Boldas are, in many ways, typical of Detroit Lubricator Company people. They stay with the company, contributing their skill and experience toward making the products better as the years go by.

DETROIT LUBRICATOR COMPANY

"DETROIT"

General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

JOHN ZINK BURNERS

One Stop Burner Servic

Conversion Burners

Type VRC

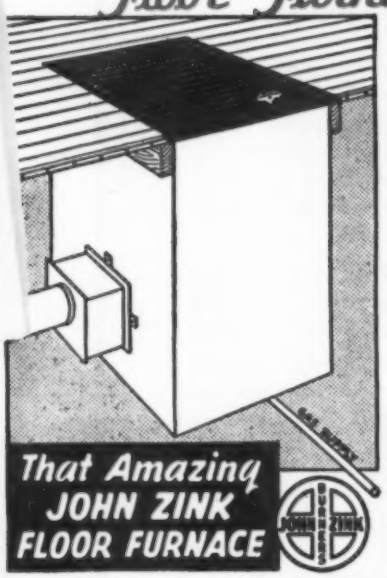
Type SC-300

The JOHN ZINK SC Conversion Burner burns from a few cu. ft./hr. to 300 cu. ft./hr. Can't back flash. It is blowout proof. Luminous flame type —no baffle needed, provided with special access door for inspection and cleaning.

The JOHN ZINK VRC Conversion Burner has the same features the SC. It is Blue Flame type. Two sizes 150 and 300 cu. ft. capacities.

THESE BURNERS WILL FIT 98% of all domestic furnaces.

Floor Furnaces



That Amazing JOHN ZINK FLOOR FURNACE

FEATURES—One large gas port, eliminates burner stoppage. Large full length combustion chamber giving uniform warm air temperature without overheat. Proper design makes possible a light air hood which is easily removed for cleaning the furnace. The gas burner is a pre-mix type, made of high grade cast iron, equipped with a pilot light. Automatic controls are available.

SIZES: No. 25 input rating 25,000 B.t.u./hr. No. 30 input rating 30,000 B.t.u./hr. No. 35 input rating 35,000 B.t.u./hr. No. 50 input rating 50,000 B.t.u./hr. No. 70 input rating 68,000 B.t.u./hr. Reasonably priced.

Unit Heaters

Long life cast iron burner of John Zink's own design and manufacture. Compact design. 100,000 B.t.u./hr. capacity. Equipped complete with built-in controls, including thermostat. Forced circulation provided by a recognized heavy duty electric motor and quiet running fan.

Piping and control equipment are simple and easy to install, and readily accessible. Require little wall room or head way can be suspended from roof trusses.

These new unit heaters are particularly adapted to heating and ventilating large or small spaces in industrial and commercial buildings.

We also manufacture Gas Burners, Oil Burners, and Combination Oil and Gas Burners for: Domestic Boiler Heating Boilers, Industrial Boilers and Power Boilers. We are willing and capable of designing and manufacturing special burners for special purposes.

JOHN ZINK COMPANY

TULSA, OKLAHOMA — NEW YORK, N.Y.

HOUSTON, TEXAS — DETROIT, MICH.

MAKE THIS YEAR YOUR BIG YEAR

GRAND RAPIDS FURNACE CLEANER
Model of *The Doyle* VAC-IT

A PLAN FOR MORE PROFITS!

"A Plan to Increase Your Sales" comes with the Grand Rapids Furnace Cleaner. It is based on successful business experience and is a practical method that will work for you. With this proven plan you can increase your business economically and enjoy greater profits.

PROFITS FROM CLEANING JOBS!

You can efficiently clean any type of heating system or chimney with a Grand Rapids Furnace Cleaner. This powerful cleaner is a durable quality built unit that will give you years of service with practically no maintenance cost. The Work Manual tells you how to do the job correctly and how much to charge, enabling you to make a daily cash income and profit on your cleaning and repair work.

PROFITS FROM MORE EQUIPMENT SALES!

Get into the home owners' basement with your cleaning service and gain his confidence in your work. Learn and study his heating needs. After a good cleaning job your new equipment recommendations are more carefully considered and sales develop naturally.

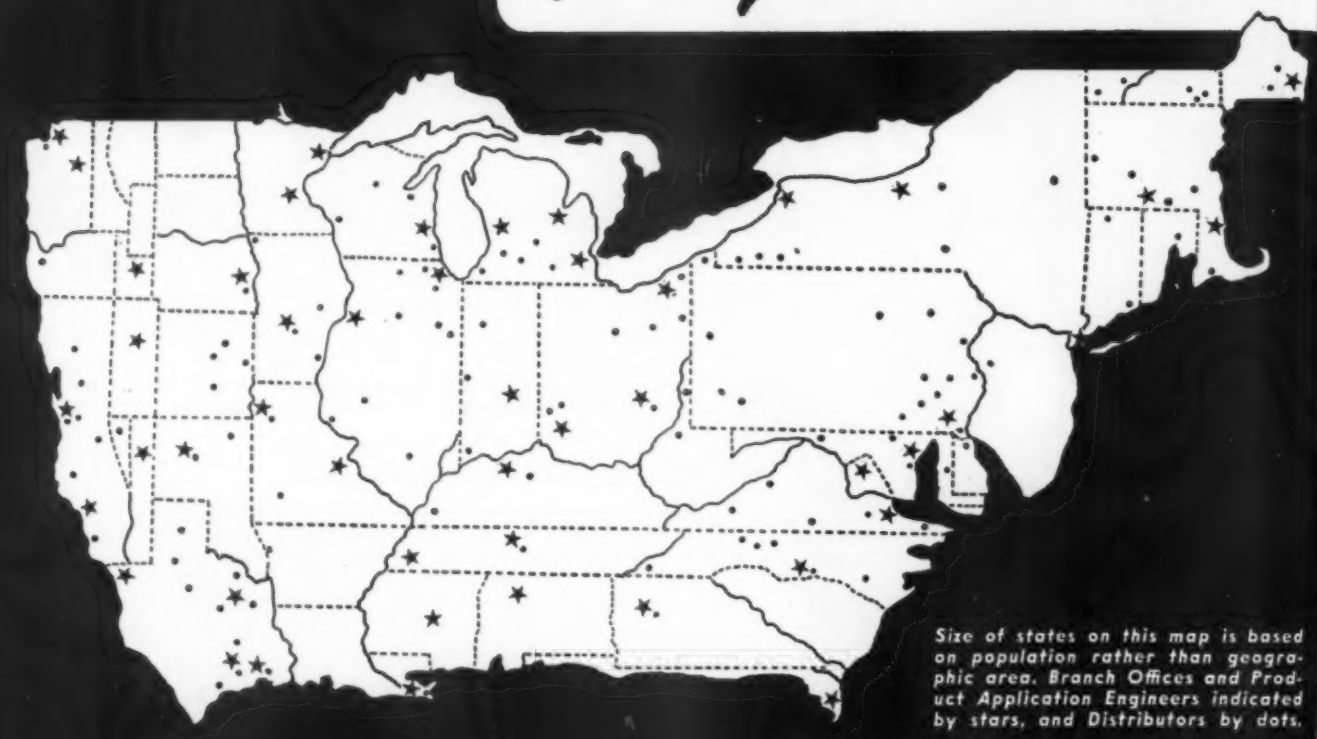
MORE SATISFIED CUSTOMERS!

A Grand Rapids Furnace Cleaner model of the Doyle VAC-It quickly eliminates worry about soot and other flue travel "plug-up" conditions by solving heating problems and saving vital fuel. This makes more satisfied customers, and when they are your customers you have eliminated competition and established a high reputation for your service.

Use the Grand Rapids Furnace Cleaner for your opening wedge to more business and more profits by merchandising through your service department. Don't delay — write for full details today!

DOYLE VACUUM CLEANER CO., 1225 Stevens Street, S.W., Grand Rapids, Mich.

At your service -



Size of states on this map is based on population rather than geographic area. Branch Offices and Product Application Engineers indicated by stars, and Distributors by dots.

HERMAN NELSON today offers you . . . in addition to a line of quality unit heaters, unit ventilators, propeller and centrifugal fans . . . the services of a nation-wide distributor organization.

Branch Offices, Product Application Engineers and Distributors are located in principal cities and industrial centers of the country. All have Herman Nelson-trained personnel ready to assist you with practical as well as technical information in the selection of the exact type and size of equipment best suited to each heating and ventilating job.

This is important too. Many Distributors now carry stocks of Herman Nelson heating and ventilating products. If, because of heavy demands for Herman Nelson equipment, a Distributor may temporarily be out of a product you need for a specific job, he will endeavor to obtain it as quickly as possible. In this, he will receive our full cooperation.

Herman Nelson Direct Drive

Herman Nelson Belt Drive Propeller Fans

Herman Nelson Horizontal Shaft Propel-

Herman Nelson Type H Centrifugal Fans

Herman Nelson Vertical Shaft Propeller-Fan Type Unit Heaters

Herman Ne Type H Centrifugal

Herman Nelson Nation-Wide Distribution

Herman Nelson Branch Offices

Baltimore—G. M. Heslop, Product Application Engineer.
Boston—W. N. Murray, Mgr., J. F. Flannery, Product Application Engineer.
Chicago—C. A. Pickett, Mgr., J. C. Donaldson, Herman Stai, Product Application Engineers.
Cincinnati—W. J. Killian, Product Application Engineer
Detroit—M. E. Van Vliet, Mgr.
Milwaukee—Carl Amundson, Product Application Engineer.
Minneapolis—Homer Melvin Bird, Product Application Engineer.
Moline—Anthony Spoodis, Product Application Engineer.
New York—J. A. Finnerty, Mgr.
Philadelphia—P. A. Cavanagh, Mgr.
Springfield (Mass.)—J. E. Carey, Product Application Engineer
St. Louis—Henry C. Sharp, Mgr., E. Paul Harder, Product Application Engineer.
Syracuse—Lawrence C. Ward, Product Application Engineer.
Washington—J. M. Osborne, Product Application Engineer.

Herman Nelson Product Application Engineers

Albuquerque, N. M.—Boyd Engineering Co., Ltd.
Atlanta, Ga.—Felix J. Commagere
Birmingham, Ala.—Hugh C. Boisclair
Buffalo, N. Y.—Edward H. Cox
Cape Elizabeth, Me.—The Partridge Co.
Charlotte, N. C.—Charles M. Setzer & Co.
Cleveland, O.—H. W. Kaiser Company
Columbus, O.—Russell H. Smith Equipment Co.
Dallas, Tex.—W. E. Lewis & Co.
Denver, Colo.—Fox & Company
Des Moines, Iowa—Products, Inc.
Duluth, Minn.—Williams-Swanson Co.
El Paso, Tex.—Boyd Engineering Co., Ltd.
Grand Rapids, Mich.—O. D. Marshall
Houston, Tex.—D. R. Rippey
Indianapolis, Ind.—George Heidenreich
Jackson, Miss.—H. M. Ludlow
Kansas City, Mo.—H. H. Wright Company
Louisville, Ky.—John Zimmermann
Los Angeles, Calif.—F. J. Hearty & Co.
Memphis, Tenn.—Southern Sales Co.
Miami, Fla.—R. P. Kelley
Minneapolis, Minn.—P. R. Reese
Nashville, Tenn.—Southern Sales Co.
New Orleans, La.—L. Villere Cressy Co.
Oklahoma City, Okla.—O. T. Carroll
Omaha, Neb.—Verne Simmonds
Richmond, Va.—W. Wallace Neale
Saginaw, Mich.—W. A. Witheridge Co.
Salt Lake City, Utah—Rushby C. Midgley
San Antonio, Tex.—Harry J. Dalton
San Francisco, Calif.—E. C. Cooley Co.
Seattle, Wash.—E. H. Langdon Co.
Spokane, Wash.—R. L. Nelson

Herman Nelson Distributors

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New Bedford, Mass.
Bailey-Farrell Co.
Pittsburgh, Pa.
Baker Specialty & Supply Co., Inc.
Logansport, Ind.
E. Best Plbg. & Htg. Supply Co.
Quincy, Ill.
W. L. Blake & Co.
Portland, Me.
Bond Supply Co.
Kalamazoo and Battle Creek, Mich.
J. C. Bowles Co.
Seattle, Wash.
J. R. Bradley Co.
Reno, Nevada
Braid Electric Co.
Nashville, Tenn.
Brammall Supply Co.
Benton Harbor, Mich.
Brock-McVey Co., Inc.
Lexington, Ky.
Bruce-Rogers Co.
Fort Smith, Ark.
Calcasieu Lumber Co.
Austin, Tex.
Canney-Plue, Inc.
Rutland, Vt.
Careva Company
York, Pa.
Carman-Thompson Co.
Lewiston, Me.
W. A. Case & Son Mfg. Co.
Erie, Pa., and Jamestown, N. Y.
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Cedar Rapids, Ia.
Central Metal & Supply Co.
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Cooper Supply Company
Tulsa, Okla.
Harry Cooper Supply Co.
Springfield, Mo.
Cordes Supply Co.
Milwaukee, Wis.
Crane Co.
San Bernardino, Calif.
Dallman Supply Co.
Sacramento and San Francisco, Calif.
Desco Corporation
Wilmington, Del. and Chester, Pa.
R. B. Dunning & Co.
Bangor, Me.
Electric Supply Co.
Atlanta, Ga.
Evansville Supply Co.
Evansville, Ind.
Ewinger Supply Co.
Burlington, Ia.
Fox Electric Supply Co.
Elgin, Ill.
Frederick Trading Co.
Frederick, Md.
Globe Machinery and Supply Co.
Des Moines and Cedar Rapids, Ia.
Griffith Electric Supply Co.
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Hall & Knight Hardware Co.
Lewiston, Me.
Hansen Supply Co.
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Higgins Industries, Inc.
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Holyoke Supply Co., Inc.
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Industrial Supply Co.
Terre Haute, Ind.
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San Diego, Calif.
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Champaign, Danville, Elgin and Joliet, Ill.
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Peoria, Ill.
International Engr. & Supply Co.
Providence, R. I.
J. D. Johnson Co., Inc.
Poughkeepsie, N. Y.
E. Keeler Company
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Kester Machinery Co.
Winston-Salem, High Point and Burlington, N. C.
The W. H. Kiefaber Co.
Dayton and Hamilton, O.
LaCrosse Plumbing Supply Co.
LaCrosse, Wis.
Latrobe Plumbing Supply Co.
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Lehigh Valley Supply Co.
Allentown, Lansdale, East Stroudsburg and Easton, Pa.
LeValley, McLeod, Kinkaid Co., Inc.
Elmira, Olean, Schenectady, N. Y.
The Link Company
Jackson, Mich.
Luzerne & Lackawanna Supply Co.
Wilkes-Barre, Pa.
Manufacturers Selling Co.
Trenton, N. J.
Marsden & Wasserman, Inc.
Hartford, Conn.
Michigan Supply Co.
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Utica and Binghamton, N. Y., Springfield, Mass., & St. Johnsbury, Vt.
Morrison Supply Co.
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Mott Bros. Company
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Murphy Supply Co.
Green Bay, Wis.
The Ohio State Supply Co.
Youngstown, O.
Palmer Plumbing Supply Co.
Laconia and Rochester, N. H.
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Portland, Me.
The Penn State Supply Co.
Sharon, Pa.
Reading Foundry & Supply Co.
Reading, Pottsville, and Lebanon, Pa.
Robbins-Gamwell Corporation
Pittsfield, Mass.
The Roekel Company
Zanesville, O.
The Salina Supply Co.
Salina, Kan.
San Antonio Machine & Supply Co.
Corpus Christi and Waco, Tex.
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Southern Equipment Co.
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Strong, Carlisle & Hammond Co.
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Tay-Holbrook, Inc.
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Leavenworth, Kan.
The Topeka Steam Boiler Wks. Co., Inc.
Topeka, Kan.
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Geo. E. Trudel Co.
Manchester, N. H.
U. S. Supply Co.
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Parkersburg, W. Va.
J. A. Walsh & Co., Inc.
Houston, Texas
Washburn-Garfield Co.
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Western Maryland Supply Co.
Hagerstown, Md.
Wigman Company
Sioux City, Ia.
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Wausau, Wis.
Yelton-Weaver Supply Co.
Springfield, Ill.

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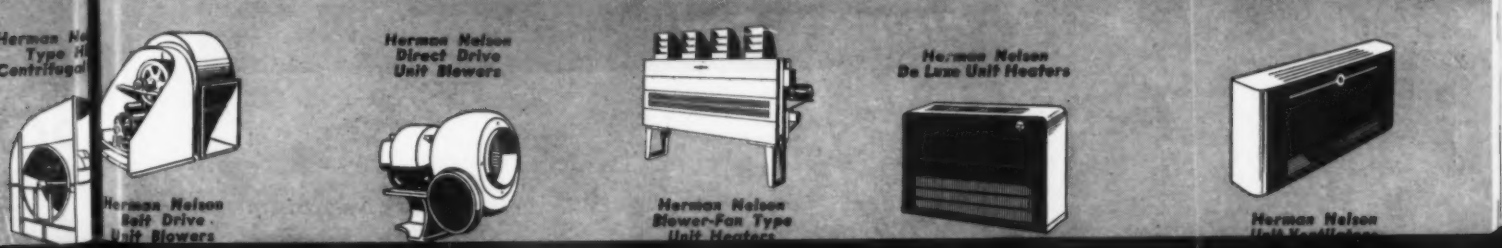
THE HERMAN NELSON CORPORATION

Manufacturers of Quality Heating and Ventilating Products

GENERAL OFFICES AND FACTORIES LOCATED AT MOLINE, ILLINOIS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Herman Nelson Belt Drive Unit Blowers
Herman Nelson Blower-Fan Type Unit Heaters
Herman Nelson De Luxe Unit Heaters

FOR YOUR MORE PROSPEROUS NEW YEAR

WRITE FOR THIS NEW GUIDE TO AIR FILTER SALES AND PROFITS

Following our strict policy of selling only through the warm-air heating, ventilating and refrigeration trades, we have just completed an illustrated booklet that shows you how Detroit Air Filters give your customers EXTRA air filter service for their money, win their good will and repeat business and step up your profits. Find out today what Detroit's exclusive WICK ACTION can mean to you from now on.

Write for your free copy today — sure.

DETROIT AIR FILTER COMPANY

1228 WEST KINZIE STREET • CHICAGO 22, ILLINOIS

MEET Your Viking Distributor

—and begin a business relationship that will pay handsome dividends through the busy years ahead.

This is a friendly message to Contractor-Dealers in the heating and air-conditioning business who have not yet established connections with the VIKING Distributor nearest them. We say—"Meet him as soon as possible, and work out a plan that will put you in line to make some real money as new building and modernization opens up in your territory."

He has built a sound and successful business on the foundation of SERVICE. He is a Specialist in handling the expensive and time-consuming operations you don't like to do, and doing them for you at a fraction of what it costs you to do them for yourself. He saves you the TIME you need to work at your own specialty.

You will find your Viking Distributor to be the best friend you ever had in business. Write to us for his name. We'll ask him to see you at the earliest possible moment.

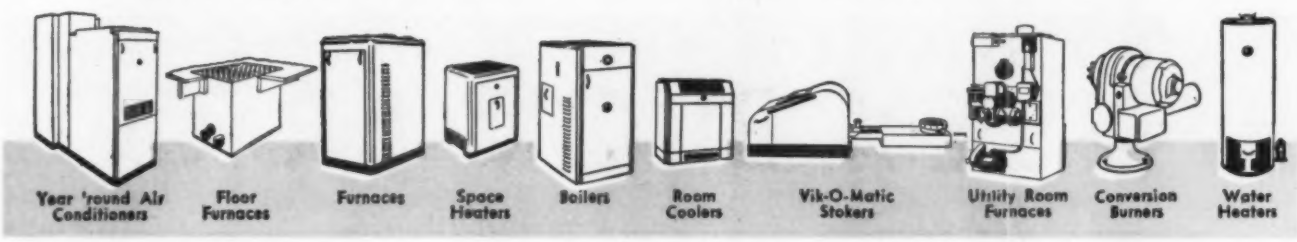
Here's What

These are some of the jobs your Viking Distributor does for you

1. He warehouses everything you need —Equipment and all accessories.
2. His Sales-Engineer helps you figure jobs—schedules materials for delivery as each job progresses.
3. He keeps the inventory—and delivers what you need *WHEN* you need it—ON THE JOB.
4. He maintains a complete display of VIK-O-MATIC equipment, for your use—to help you show your customers what they should buy.
5. He helps you with your advertising and sales promotion.
6. He saves TIME and expense for you.

VIKING MFG. CORPORATION

1747 CHESTER AVENUE, CLEVELAND, OHIO

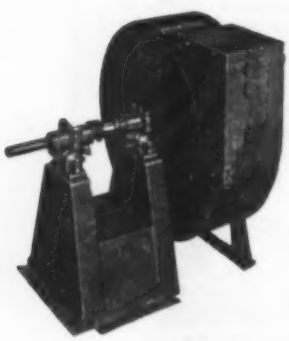


Bayley "CUSTOM BUILT" FANS

Arrangement No. 2
Overhung blast wheel and pulley, regularly equipped with roller bearings.

Bayley "Ex" Exhaust Fans, custom built to meet the individual needs of industry, are without a doubt the most advanced, efficient and durable fans available. Built in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM capacity with pressures up to 15" W.G., they cover a wide range of applications in all types of industrial and war plants. Bayley "Ex" Fans are designed and constructed to operate faultlessly under the most adversed conditions . . . they can be made explosion proof . . . non-ferrous . . . and are produced in stainless steel to handle high temperature gases up to 1600° F. Bayley Blowers give assurance of lasting, trouble-free service . . . and will do your specific job better. Investigate their possibilities for your particular purpose NOW!

TYPICAL USERS OF BAYLEY PRODUCTS



Arrangement No. 1
Overhung blast wheel, pulley drive, regularly fitted with ring oiling bearings. (Ball bearing optional)

Allis-Chalmers Mfg. Company
The American Monorail Company
Armour & Company
The Borden Company
Briggs & Stratton Corporation
Carnegie Illinois Steel Corporation
Chrysler Corporation
Cleaver-Brooks Company
The Day Company
Despatch Oven Company
Diamond Iron Works, Incorporated
And the Mahr Mfg. Company Division
The Dow Chemical Company
Dravo Corporation
Ford Motor Company
Harnischfeger Corporation
The Heil Company
Marquette Cement Mfg. Company
Nash Kelvinator Corporation
The Pennsylvania Railroad Company
Phoenix Hosiery Company
A. O. Smith Corporation
A. E. Staley Mfg. Co.
Swift & Company

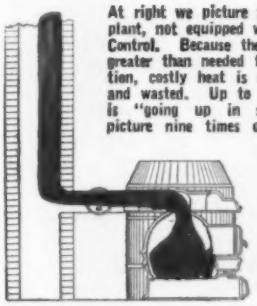
Arrangement No. 4
Housing, wheel and motor subbase only for direct motor drive.

CONSULT US ON YOUR ENGINEERING PROBLEMS

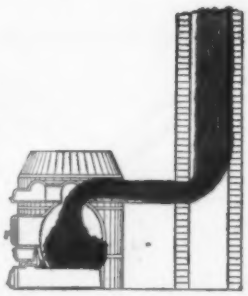
BAYLEY BLOWER CO.

1817 SOUTH 66TH STREET MILWAUKEE, WISCONSIN

Here's Why They're Needed



At right we picture an average heating plant, not equipped with a Field Draft Control. Because the chimney draft is greater than needed for proper combustion, costly heat is drawn up the flue and wasted. Up to 25% of the fuel is "going up in smoke." A true picture nine times out of ten.

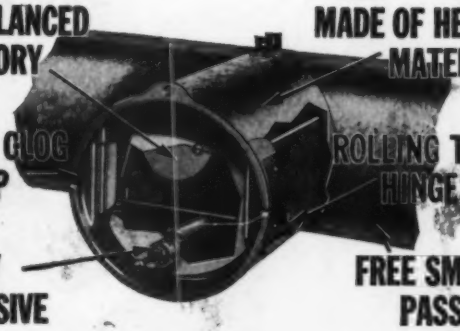


Now, a Field Draft Control has been installed (left); the waste is ended. Barometric pressure opens the gate a precise distance, and all draft, excepting the minimum needed to carry smoke up the chimney is drawn off through the opening. Heat is more even; fuel savings range up to 25%.

Here's Why They're Best

GATE BALANCED AT FACTORY

MADE OF HEAVY MATERIAL



DOESN'T CLOG OR WARP

ROLLING TYPE HINGE PIN

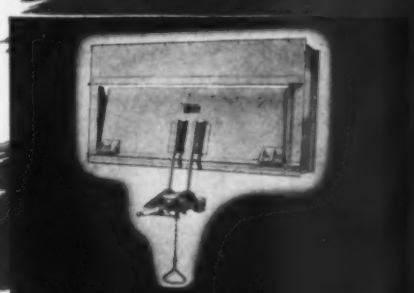
QUICKLY RESPONSIVE

FREE SMOKE PASSAGE

The famous FIELD TYPE "M" DESIGN — a basic design that has never been successfully copied.

field

BAROMETRIC DRAFT CONTROLS



FIELD CONTROL DIVISION

OF H. D. CONKEY & CO. MENDOTA, ILLINOIS

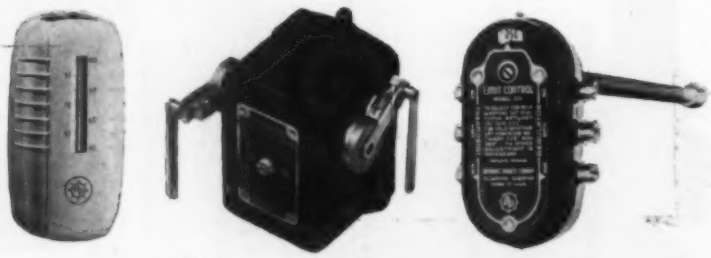
Here's How To Stop Basement "Burglars"

WHO'VE BEEN GIVING YOUR CUSTOMERS THE "SHIVERS"

Hit-or-miss firing and regulating of hand-fired furnaces is one of the boldest "burglars" that ever sneaked through a basement window! . . . Stealing FUEL value that should be heating your customers' homes comfortably and economically instead of going up the chimney flue . . . Causing temperature irregularities that bring illnesses and colds.

Arrest this common cause of so much home heating trouble for your coal-burning customers, by installing the

AUTOMATIC HEAT REGULATOR SETS—and perform a timely service that will build lasting good-will! For this "A-P" Automatic Heat Regulator Set is a great fuel saver — positively preventing "take-a-chance" furnace-firing waste.



See how easily **THIS FUEL-WASTE ARRESTER IS INSTALLED . . .**

Attach "A-P" Thermostat to inside wall, 4 feet above floor. It "floats" the fire, and convenient, easy-to-read setting controls room temperature within 1°. Actuates damper control. Easy to install. Ivory-tone cover contains accurate thermometer.

Now place an "A-P" Limit Control on the furnace bonnet, preventing furnace heat from overshooting room thermostat setting. Keep Limit Control adjusted to outside weather for satisfactory sentineling of fire.

Finally install the "A-P" Damper Regulator, and connect to Room Thermostat and Limit Control. Unit is treated to avoid rusting from summer basement dampness.

DELIVERIES of "A-P" Automatic Heat Regulator Sets, with or without Limit Control, are now in full swing. Be sure to stock enough to take care of all your customers' immediate requirements.

AUTOMATIC PRODUCTS COMPANY
2470 N. 32nd STREET MILWAUKEE 10, WISCONSIN

DEPENDABLE *Controls*

FOR HEATING • AIR CONDITIONING • REFRIGERATION

A FULL LINE FOR FULL PROFITS

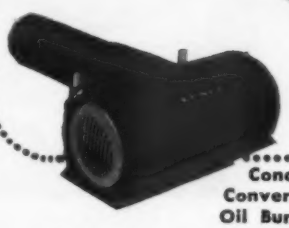
Conco
Coal-fired
Winter-
Airconditioners

Conco
Domestic
Stokers

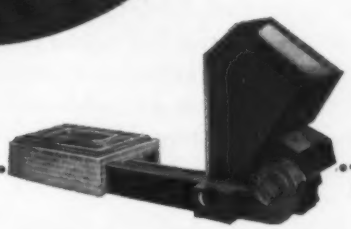
Conco
Oil-fired
Winter-
Airconditioners

CONCO *heat*

Conco
Gas-Fired
Winter-
Airconditioners



Conco
Conversion
Oil Burners



Conco
Commercial
Stokers

Conco Production Is Of Course Still Limited. Increased Output Is Anticipated Early In 1946.

CONCO ENGINEERING WORKS
MENDOTA, ILLINOIS

This happens to the best galvanized sheets...

Galvanized sheet steel is an excellent material for much sheet metal work, but there is one thing it won't do. It won't take and hold paint satisfactorily. The picture tells the story. The raw surface dried out the essential oils in the paint, caused it to become brittle. Result: early paint failure.

This happens even when the zinc surface is acid-etched. Etching has other disadvantages, too. Besides being troublesome and costly it destroys part of the protective zinc coating.

Paint on regular galvanized steel *isn't* satisfactory . . .

But this bonds paint to zinc

ARMCO Galvanized PAINTGRIP sheets are the answer to this old problem. What's more, they give your sheet metal work this *triple protection* . . .

1. The steel base has a *full-weight coating of zinc.*

2. The coating is given a special Bonderizing treatment at the Armco mills.

3. This "insulated" surface grips the paint finish in a lasting bond—prevents it from drying out quickly, retards peeling.

Whatever you make of galvanized steel that is to be given an *attractive and durable* paint finish, ARMCO Galvanized PAINTGRIP sheets are the logical choice. Write for the free PAINTGRIP booklet. It gives complete information. Just address The American Rolling Mill Co., 151 Curtis Street, Middletown, O.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

The "Scratch Test" shows how paint sticks to ARMCO Galvanized PAINTGRIP Steel. The top half of the sample is mill-Bonderized and when scratched with a penknife only a slight mark can be seen. Paint on ordinary galvanized (bottom half) scrapes off readily.

The American Rolling Mill Company

SPECIAL-PURPOSE SHEET STEELS

GALVANIZED PAINTGRIP ★ ARMCO ★ STEEL

AUER QUALITY IS STILL AUER QUALITY

During the ups-and-downs of wartime production, the meager register supplies, and the imperfect service that all customers patiently endured—Auer kept one principle always in front: that the QUALITY of our products MUST be as high as it possibly could be. All temptation to unload, on a starved market, goods of inferior quality was rigidly resisted. Either our customers got GOOD registers or NO registers. The result is that most Auer customers are STILL Auer customers.

That time of stress and strain is now happily past. Today we are able to furnish Auer Registers, not as fast as you or we would like, but with some semblance of old-time Auer Service. And now—as always—you can be sure that the QUALITY of Auer Registers and Grilles will be kept right up there, ON TOP!

No. 800 Heat-Rite 2-Piece Gravity Baseboard Register

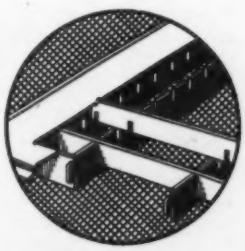


Illustration shows construction and assembly of DuraBilt registers and cold air faces, with all bars mortised and locked at cross joints, and also interlocked to frame—the strongest and most rigid method ever devised for this type of register.

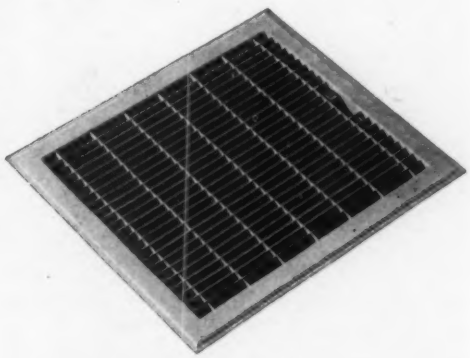
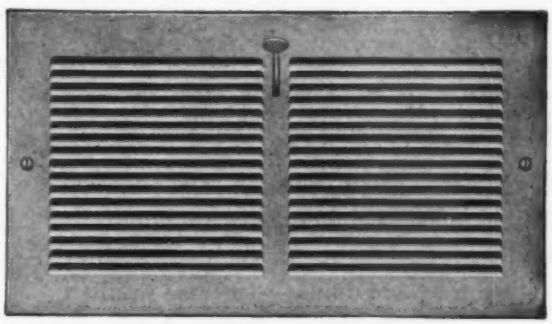
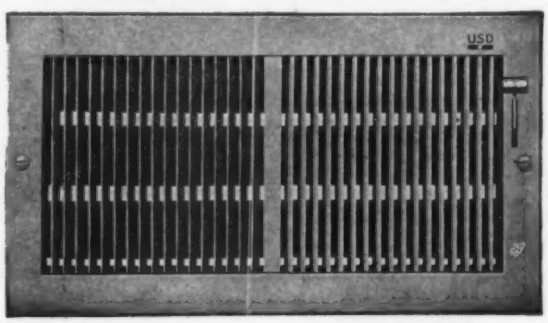


Fig. DR DuraBilt Floor Register



No. 7032 Airo-Flex Single Louvre Adjustable Face Register

Auer manufactures a complete line of gravity and air conditioning registers and intakes for all purposes, and also stamped metal grilles. Ask for Auer Register Book or Grille Catalog "G."



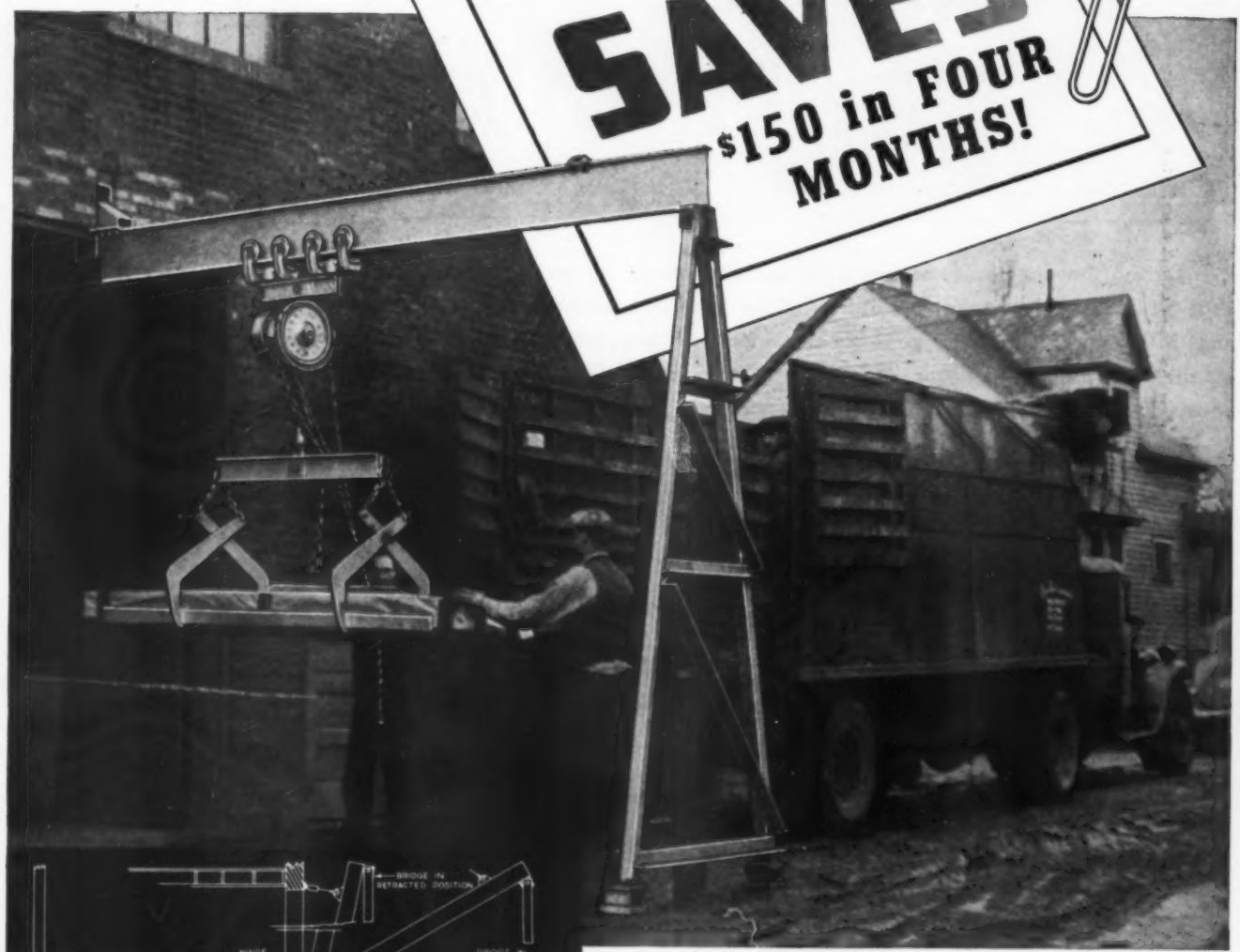
No. 4432 Airo-Flex Multi-Louvre Adjustable Face Register

THE AUER REGISTER CO., 3608 Payne Ave., Cleveland 14, Ohio

Auer REGISTERS & GRILLES for AIR CONDITIONING & GRAVITY

SIMPLE OVERHEAD HANDLING SYSTEM

SAVES $150 in FOUR MONTHS!



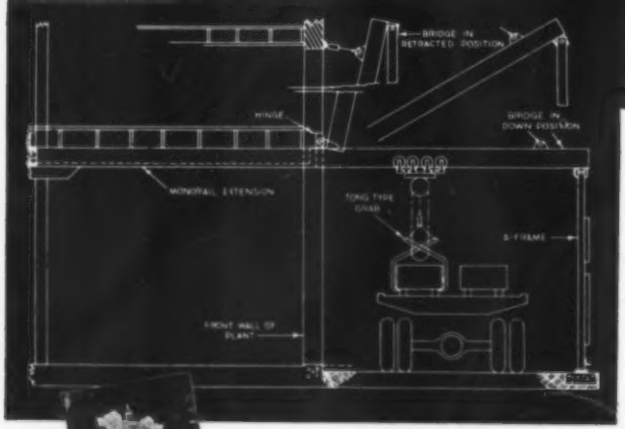
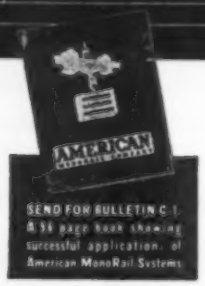


Diagram shows simple system for unloading steel. Crane is retracted against building over door when not in use.



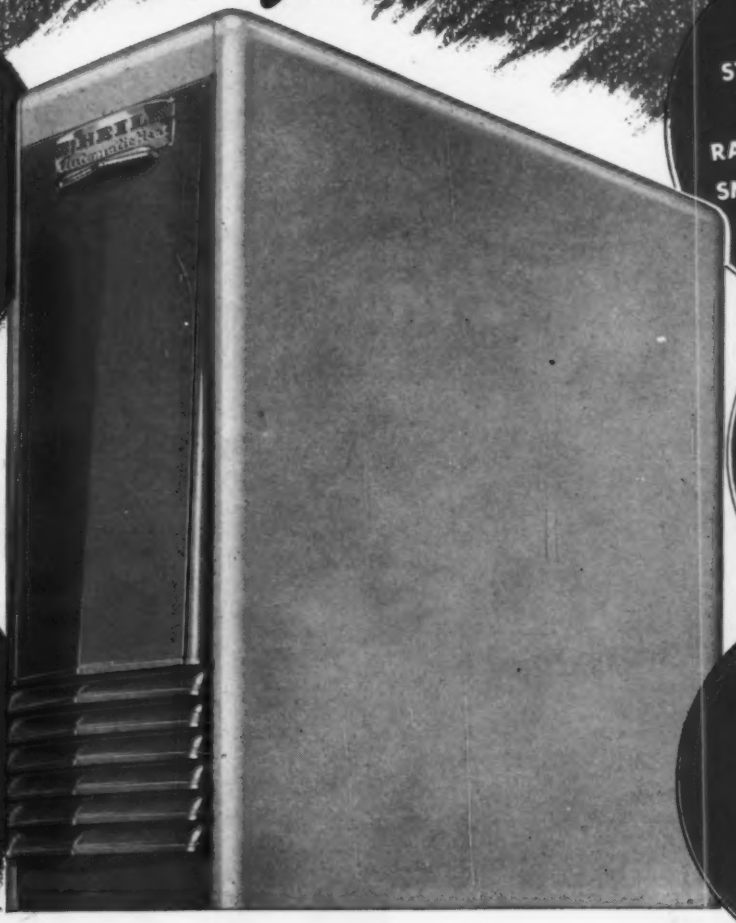
● Steel, formerly unloaded sheet by sheet, is now transferred from trucks to storage in 3-ton bundles. Handling labor was greatly reduced and damage to metal entirely eliminated.

Simple systems like this, worked out by American MonoRail engineers to meet hundreds of operations, speed up production — lower costs — reduce accidents — release skilled hands for more profitable use. Let an American MonoRail engineer show how you can save time and money. Write today!

THE AMERICAN MONORAIL CO.

13133 ATHENS AVE. - CLEVELAND 7, OHIO

Choose the Style Leader for '46



STYLED BY A NATIONALLY FAMOUS INDUSTRIAL DESIGNER FOR SURE SALES APPEAL

MODERN STREAMLINE JACKETS FEATURE WIDE-RADIUSED CORNERS AND SMOOTH INTERLOCKING PANELS

ISTINCTIVE FRONT DOOR . HAS COMBINED AMEPLATE AND NDLE IN BRIGHT CHROME

NEW HARMONIOUS COLOR COMBINATIONS BLEND WITH MODERN BASEMENT PLAYROOM DECORATIVE SCHEMES

MODERN DEEP-CROWNED LOUVERS SET A NEW STYLE NOTE IN HEATING UNIT DESIGN

GLISTENING SYNTHETIC ENAMEL FINISH BAKED BY INFRA-RED FOR DURABILITY

n you put Heil's new oil-fired heating units on your floor for the first time, you'll really appreciate what it s to handle the style leader for '46!

u'll be proud of your choice when you see how this ing, new styling catches every prospect's eye . . . how fresh, modern treatment by a famous industrial de- makes selling easier for you. You'll see buyers admire harmonious new color combinations . . . hear them the trim, sleek lines of the jackets and marvel at the e of unsightly screws, bolts and seams.

HEIL COMBINES BEAUTY WITH PERFORMANCE

Beauty is more than skin deep in the new Heil line. Inside and you'll find evidence of the soundest engi- g in the industry. You'll see a wealth of new features mean smoother, quieter and more efficient operation ur customers . . . and new ease of installation and for you. You'll see quality construction, too, in detail . . . the finer materials and sounder workman- hat keep Heil installations sold and customers happy.

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

WHAT A HEIL FRANCHISE MEANS IN PROFITS

Don't handicap yourself in the postwar competition for heating sales. For your profits' sake, be sure you handle a line with the modern styling to attract buyers and the advanced engineering to clinch sales . . . be sure to get all the facts on Heil before you make a choice. You'll find Heil's straightforward dealings a new experience in friendly co-operation. You'll find Heil's merchandising policies better geared to your local conditions. Mail the coupon today for Heil's new booklet giving full-color reproductions of every model in the line and a complete story about the powerful selling aids that will help you make more sales in '46.

MANY VALUABLE TERRITORIES OPEN

The Heil Co., Dept. A-1
Milwaukee 1, Wisconsin

Send me your dealer pre-view book showing full-color reproductions of the new Heil models and complete details about the Heil franchise, Merchandising Assistance and openings in my territory.

Name.....

Company.....

Address.....

City.....Zone...State.....

Sciaky portable spot welding units are designed with the accent on lightness – both in guns and cables.

The use of high tensile metals plus skillful design, saves weight . . . makes the gun easier and faster to handle . . . more accessible, too.

Both pneumatic and hydraulic units are available in ratings of 50, 75 and 100 KVA. Sciaky electronic control units provide electronic control of welding sequence, current interruption and welding heat. Transformers may be suspended from any type hoist for moving about. Special features include high-efficiency, light weight flexible cables, fast acting electro valve and booster, and adjustable balancing device for larger guns. A variety of standard gun types, designed for nearly every job, are available.

Hydraulic units make efficient use of water. System is automatically refilled from same line supplying cooling water in case of leakage. Rust-proof materials are used throughout.

Write for bulletin 122-A

Are you going to the Metal Show? If so, you'll want to visit our exhibit (Booth No. B-605). You'll see many of the latest Sciaky Welders in operation.

4905 West 67th Street
Chicago 38, Illinois

SCIAKY BROS.

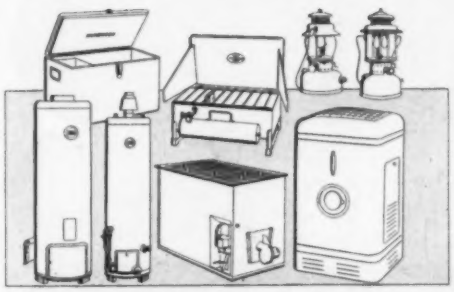
AMERICAN GAS MACHINE COMPANY

AGM

ALBERT LEA, MINNESOTA

50th ANNIVERSARY

1896-1946 *50 years of continuous manufacturing experience*



The American Gas Machine Company has stood back of its products for half a century. It has 50 years of know how . . . pride in a good name . . . and the determination to keep that name standing for "Always Good Merchandise."

*Always Good Merchandise

*Copyright 1945, American Gas Machine Co.

Central States

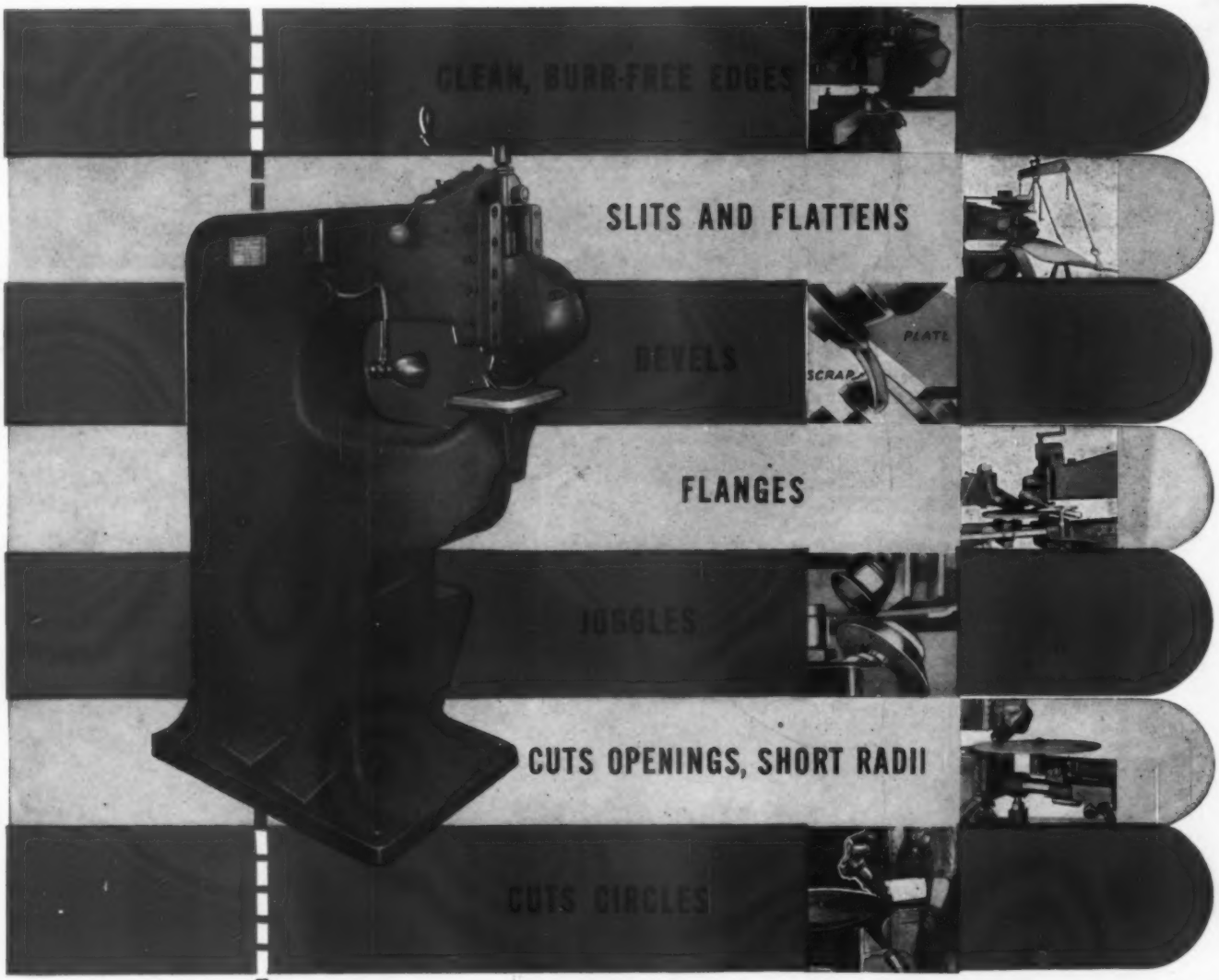
The Allen Company Dallas, Texas
American Radiator & Standard Sanitary Corp. Shreveport, Louisiana
Atlas Supply Division—Jones & Laughlin Supply Co. Muskogee, Oklahoma
Beacon Supply Company New Orleans, Louisiana
Better Home Products, Inc. Nashville, Tennessee
Big Spring Hardware Company Big Spring, Texas
Blankenship Supply Company Wichita Falls, Texas
Boca Chica Hardware Company, Ltd. Brownsville, Texas
Brennan Appliance Distributors Detroit, Michigan
Brown-Camp Hardware Company Des Moines, Iowa
Buhrman-Pharr Hardware Company Texarkana, Arkansas
Bush-Caldwell Company Little Rock, Arkansas
Cardinal Distributors St. Louis, Missouri
Clifton-Simpson Hardware Company Waco, Texas
Crane Company Memphis, Tennessee
F. R. Dengel Company Milwaukee, Wisconsin
Dimmick Supply Company Opelousas, Louisiana
Donovan Boat Supplies New Orleans, Louisiana
Dorrance Supply Company Youngstown, Ohio
Duluth Plumbing Supplies Company Duluth, Minnesota
Electric Fixture & Supply Company Omaha, Nebraska
E. Garnich & Sons Hardware Company Ashland, Wisconsin
Gates Hardware & Supply Company Tulsa, Oklahoma
Goodin Company Minneapolis, Minnesota
Gulf Coast Marine Supply Company, Inc. Mobile, Alabama
E. J. Gustafson Company Sioux Falls, South Dakota
Heusinger Hardware Company San Antonio, Texas
Higgins Industries New Orleans, Louisiana
Independent Distributors Grand Rapids, Michigan
Jahns Supply Company Ft. Worth, Texas
Joplin Supply Company Joplin, Missouri
Kiefer-Stewart Co. Indianapolis, Indiana
Kitchenkook Stove Store Denver, Colorado
Lack's Auto Supply Houston, Texas
G. A. Lotz Company New Orleans, Louisiana
Frank Lyon Company Little Rock, Arkansas
A. H. McLeod Company Mobile, Alabama
Morrow-Thomas Hardware Company Amarillo, Texas
Michigan Hardware Company Grand Rapids, Michigan
Muntz & Lea Company Rockford, Illinois
N. O. Nelson Company Dallas, Texas
Ogilvie Hardware Company Shreveport, Louisiana
Orgill Brothers & Company Memphis, Tennessee
J. S. Oshman Company Houston, Texas
Ozark Motor & Supply Company Springfield, Missouri
Phillips Petroleum Company Bartlesville, Oklahoma
John Pritzlaff Hardware Company Milwaukee, Wisconsin
Roberts-Sanford & Taylor Company Sherman, Texas
W. H. Richardson Company Austin, Texas
W. A. Roosevelt Company LaCrosse, Wisconsin
Sabine Supply Company Orange, Texas
San Antonio Machine & Supply Company Corpus Christi, Texas
San Antonio Machine & Supply Company Harlingen, Texas
Shobe, Inc. Memphis, Tennessee
Southwestern Hardware Company Oklahoma City, Oklahoma
Stauffer-Eshleman & Company New Orleans, Louisiana
Straus-Bodenheimer Company Houston, Texas
Superior Distributing Company Kansas City, Missouri
Texas Farm Supply Houston, Texas
U. S. Supply Company Omaha, Nebraska
U. S. Supply Company Wichita, Kansas
J. A. Walsh & Company Houston, Texas
West Texas Wholesale Supply Co. Abilene, Texas
White's Auto Stores Wichita Falls, Texas
Woodward, Wight & Company, Ltd. New Orleans, Louisiana

Eastern States

American Hardware Company Charlotte, North Carolina
Appliance Distributors, Inc. Portland, Maine
S. Arnao Company Brooklyn, New York
Baltimore Salvage Company Baltimore, Maryland
Bondurant Brothers Company Knoxville, Tennessee
Bowers Wholesale Corporation Norfolk, Virginia
Brown-Rogers-Dixson Co. Winston-Salem, North Carolina
Frank T. Budge Company Miami, Florida
Burden-Bryant Company Springfield, Massachusetts
Delaware Hardware Company Wilmington, Delaware
Eddy and Company, Inc. Providence, Rhode Island
Electric Appliance Distributors Williamsport, Pennsylvania
Florida Hardware Company Jacksonville, Florida
Gas Engine & Electric Company Charleston, South Carolina
Harrisburg Autoparts Company Harrisburg, Pennsylvania
J. R. Hunt & Company Baltimore, Maryland
James-Stevens Company Albany, Georgia
W. S. Jenks & Sons Washington, D. C.
Kemp Equipment Company Rochester, New York
Kemp Equipment Company Buffalo, New York
Kile-Jacobs Company Wilkes Barre, Pennsylvania
Knight & Wall Company Tampa, Florida
Loeb Hardware Company Montgomery, Alabama
Marine Mart, Inc. Atlantic City, New Jersey
Radio & Motor Service, Inc. Altoona, Pennsylvania
Reese-Baxter Company Chester, Pennsylvania
C. Y. Schelly & Bro., Inc. Allentown, Pennsylvania
Shapiro's Distributing Company Albany, New York
Shapiro Sporting Goods Company Newburgh, New York
Smith Hardware Company Goldsboro, North Carolina
Steel City Supply Company Birmingham, Alabama
Supplee-Biddle Company Philadelphia, Pennsylvania
Tel-Ra Appliance Company Philadelphia, Pennsylvania
David B. Taylor Company Baltimore, Maryland
Tri-State Supply Company Chattanooga, Tennessee
United Distributors, Inc. Cambridge, Massachusetts
United Distributors, Inc. Washington, D. C.
Finsburg's Trenton, New Jersey
Van Ness Company, Inc. Potsdam, New York

Western States

Afton-Lamp Electric Company Boise, Idaho
Black Hills Radio Dealers Lead, South Dakota
Black Hills Radio Dealers Rapid City, South Dakota
Fey & Krause, Inc. Los Angeles, California
Kiefer Sales Co. Fargo, North Dakota
Flint Distributing Company Salt Lake City, Utah
They Heyman Company, Inc. San Francisco, California
Hydro-Carbon Light Company Seattle, Washington
Jensen-Byrd Company Spokane, Washington
Kalispell Mercantile Company Kalispell, Montana
Albert Mathias & Company El Paso, Texas
Missoula Mercantile Company Missoula, Montana
Montana Hardware Company Butte, Montana
Montana Hardware Company Great Falls, Montana
Montana Plumbing Supply Company Great Falls, Montana
Motor Service Company Minot, North Dakota
Northwest Supply Company Butte, Montana
Peerless Pacific Company Portland, Oregon
Pioneer Appliance Company San Francisco, California
Pioneer Tent & Awning Company Boise, Idaho
Rapid Wholesale & Distributing Co. Rapid City, South Dakota
Schulte Hardware Company Casper, Wyoming
Stephens Wholesale Company Phoenix, Arizona
Taylor Refrigeration & Appliance Company Billings, Montana
Washington Stove Works Everett, Washington
Western Wholesale Hardware Company San Francisco, California



THE SHEAR THAT DOES THE WORK OF 7 MACHINES— FAST, ACCURATELY, AT LOW COST

A Quickwork-Whiting rotary shear — cost-reducing equipment for any metal-working shop—does the work of plate-edge planer, punch shear, gap shear, bevel shear, rotary splitting shear, alligator shear, and flame cutter. By means of its special attachments a Quickwork bevels, flanges, slits and flattens, joggles, and cuts circles and openings at speeds up to 150 feet per minute.

Quickwork shears are available in capacities ranging from 16-gauge sheet to one-inch mild steel plate; write for information on the various models today. Ask for Bulletin QW-100.

WHITING CORPORATION

15610 LATHROP AVENUE, HARVEY, ILLINOIS

THE COPPER ROOF on this beautiful court house at Dedham, Massachusetts was installed about 1898 . . . with copper supplied by The American Brass Company. A recent examination of the roof disclosed that the copper is in excellent condition. Records of maintenance are available only for the past 18 years, during which time no trouble has been experienced whatsoever.

For long-lasting roofs that increase in beauty with the passing years, consider the many advantages of copper.

ANACONDA

Anaconda Copper

THE AMERICAN BRASS COMPANY—General Offices: Waterbury 88, Connecticut

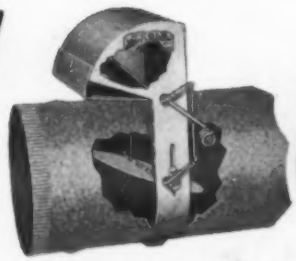
Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

C S E BAROMETRIC DRAFT CONTROLS

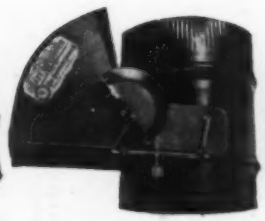
Models For Every Type and Size of Installation.
LOWER FUEL COSTS FOR YOUR CUSTOMERS.
MORE PROFITABLE SALES FOR YOU.

Cole DRAFT Governor

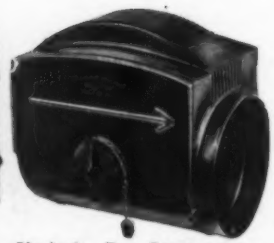
For oil, coal and gas fired heating and power plants, domestic, commercial, industrial — any size. Fully automatic, accurately balanced at factory, can be installed on any angle without taking down pipe. Holds draft to the IDEAL MINIMUM for clean, efficient combustion, effecting fuel savings up to 35%.



Standard domestic round Cole Draft Governor, sizes 5" to 18".



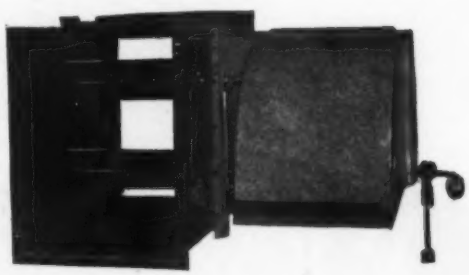
Five and six-inch standard space heater control, Type A, as shipped.



Six-inch De Luxe space heater control, Type C as shipped.

Left—Size 14" or over, side mount round Cole Draft Governor.

Right—Any size, side mount rectangular Cole Draft Governor, shown installed in section of smoke pipe.



Sullivan Draft Stabilizer

An open-check draft stabilizer especially designed for stoker and oil-burner operation. Can be mounted either on side or top of pipe. Models for all standard domestic pipe sizes from 7" through 18",—and for any size or type industrial installation.

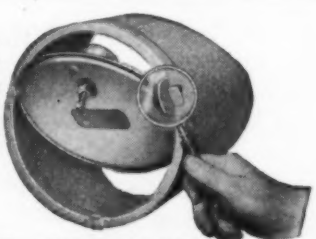
Above — Standard industrial round Sullivan Draft Stabilizer.

Right—Standard industrial square Sullivan Draft Stabilizer. All industrial stabilizers are equipped with ball bearings.

Draft KoreKtor

A low-cost, open check control with an enormous domestic installation market. Ideal for coal installations, automatic or hand fired. Large, close-fitting blade swings on knife-edge, non-clogging pivots. Easily, quickly installed, requires no servicing. 10% to 25% fuel saving.

Left — Type F, 906, 6" diameter Draft KoreKtor, for stoves and heaters. Has convenient outside draft adjustment, patented. Delivered as shown with long tee side.



Above—Type F, 909 and 912, Draft KoreKtor Equipped with universal sleeves to fit all standard domestic pipe sizes from 7" through 13". New outside draft adjustment is rustproof, positive locking.

C.S.E. has specialized for many years in manufacturing a complete line of Draft Controls to enable you to serve your customer's every need. WIRE OR WRITE FOR COMPLETE INFORMATION.

Cole-Sullivan Engineering Co. 1316 North Third Street, Minneapolis 11, Minnesota

Clip and Mail TODAY!

STOKOL STOKER COMPANY, INCORPORATED
1145 EAST 22ND STREET, INDIANAPOLIS 7, INDIANA

Gentlemen:
Send details of Stokol profit possibilities for me as a dealer.

NAME _____

ADDRESS _____

CITY _____ STATE _____

AA

Cut yourself in on this BIG STOKOL Profit Opportunity

Stokol, one of the big names in the stoker business, is launching its greatest of all programs.

Products are ready. They're the best Stokol stokers ever—fully in keeping with the long-term Stokol policy of giving the American public the best stokers money can buy. Production lines are humming.

Stokol dealers are sharing in a big profit opportunity. With domestic, commercial and industrial stokers—bin feed and hopper models burning all types of coal—they meet practically every stoker requirement. Stokol is backing its dealers with a most aggressive sales and advertising program . . . *PLUS* the word-of-mouth advertising of 140,000 Stokol users.

Some territory is open. We invite you to investigate this big Stokol profit opportunity by mailing the above coupon today.

STOKOL

CHRYSLER AIRTEMP

Up Front in the Profit Parade

It's top policy at Chrysler Airtemp to be ever mindful of dealer profits. Everything—products, advertising, merchandising—is planned with this goal in mind.

A good example is the Chrysler Airtemp dealer agreement. Flexible, it is streamlined to fit any type of dealer in the heating, air conditioning and refrigeration fields. There's an agreement for any one Chrysler Airtemp line, any combination of two—or for all three! Here's opportunity for year 'round profitable dealer operation.

All products of Chrysler Airtemp are engineered, designed and mass produced for the volume markets—the places of greatest sales. It's "package" merchandise, priced right, easy to install and with a reputation for low upkeep and operating cost. Behind these products is Chrysler Corporation with its great reputation for engineering excellence and mass production skill.

Such products, prestige and company policy are putting Chrysler Airtemp dealers up front in the profit parade—and will keep them there. It will pay you to investigate now! Write to the Airtemp Division of Chrysler Corporation, Dayton 1, Ohio. • In Canada—Thermo-Rite Products, Ltd., Toronto, Ontario.

Invest In Your Future! Buy U. S. Savings Bonds. REMEMBER THURSDAY NIGHT! The music of Andre Kostelanetz and the musical world's most popular Stars—Thursday, C.B.S., 9 P.M., E.S.T.

AIR CONDITIONING
HEATING • COOLING • REFRIGERATION

Announcing

MOR-SUN

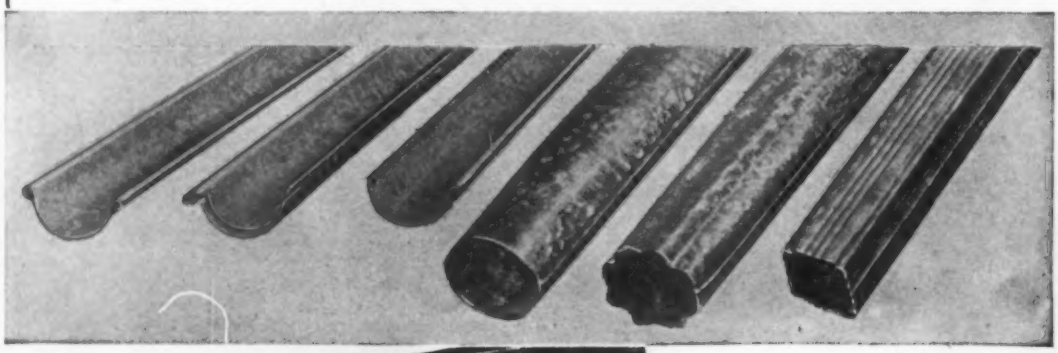
PRESSED STEEL
FURNACES

Forced Warm Air
For
Modern Home Heating

MORRISON STEEL PRODUCTS, INC., BUFFALO 7, N.Y.

RUN ORDERS AS RECEIVED DAILY AT 100 FT.P.M. ON K & R DOWNSPOUT AND GUTTER MACHINES

use money spent for storage to pay for the machines



with a machine for each size no production is lost due to roll changes.

ABOVE: THIS IS THE TYPE K&R MACHINE THAT WILL SAVE YOU MONEY

BELOW: INSTALLATION OF A BATTERY OF K&R MACHINES

MANUFACTURERS OF STRAIGHTENING ROLLS, BENDING ROLLS, COLD ROLL FORMING MACHINERY, GANG SLITTERS, LEVELLERS, ETC.

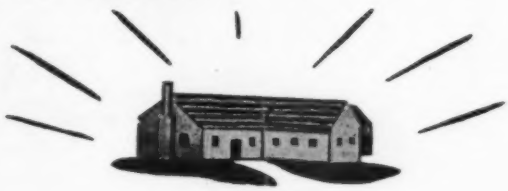
Write for further information.

KANE & ROACH

INCORPORATED
NIAGARA and SHONNARD STREETS
Syracuse, New York

8 OUT OF 10 NEW HOME OWNERS SAY...

"We want economical Automatic Heat..."



Vaporizing Oil Burner Space Heaters, Floor Furnaces, Furnaces, and Water Heaters Equipped with "A-P" CONSTANT LEVEL OIL CONTROLS Deliver This Great Market Right to Your Doorstep

The immediate future is bright for vastly increased installations of Vaporizing Oil Burner Appliances in the millions of attractive new small homes that will shortly be under construction.

The majority of these prospective owners plan to enjoy the comfort of automatic heat and the luxury of automatic hot water—economically and dependably assured by "A-P" Constant Level Oil Controls.

Prepare to promote profitable Vaporizing Oil Burner Appliances sales the "A-P" way — aided by the great advantage of assured leadership with "A-P" Constant Level Oil Controls. Complete Bulletins upon request.

Illustrated is the "A-P Model 240 WYP Constant Level Oil Control for water heaters—equipped with "Magic Pilot." The "Magic Pilot" also is available on other model controls for vaporizing burner floor furnaces and furnaces, where a low pilot flame must be maintained *indefinitely*.

AUTOMATIC PRODUCTS COMPANY
2452 NORTH 32nd STREET MILWAUKEE 10, WISCONSIN

DEPENDABLE Oil Controls

"A-P" CONTROLS ARE DESIGNED TO ELIMINATE SERVICING!

THARCO *is a better furnace cement*

THAT'S not our opinion alone—that's what the men who work with Tharco Asbestos Furnace Cement tell us! They tell us that Tharco "works" easily and that it provides a high degree of adhesion and heat resistance. They say it never shrinks, checks or powders when properly applied. Tharco seals both sides of the joint, making it gas-tight and smokeless, yet it allows for all normal expansion and contraction.

Under the toughest kind of service conditions Tharco Asbestos Furnace Cement lasts longer and gives more satisfactory results.

Leading furnace manufacturers use and recommend Tharco, and skilled furnace men everywhere have come to know this product as the furnace cement which does the job! Scientifically compounded from an exclusive Armstrong formula and using the best material obtainable, Tharco Asbestos Furnace Cement is made to meet your requirements—*it's the furnace cement that makes good workmanship better!*

Write for free copies of the valuable folder, "The Proper Use and Care of Furnace Cement."

THE ARMSTRONG COMPANY

241 South Post Avenue
DETROIT 17

4065 South La Salle Street
CHICAGO 9

319 South Crowdus Street
DALLAS 1

New Rheem Water Heaters, packed with improvements, are rolling off assembly lines

ALL NINE Rheem appliance plants are once again manufacturing things that make living more comfortable. Automatic water heaters for all fuels, floor furnaces, console and wall heaters, automatic coal stokers, water softeners, range boilers and other items are coming off our lines in daily-increasing volume.

These latest versions of time-tested Rheem appliances carry important new features — thanks to critical laboratory research that never stops looking for product improvements.

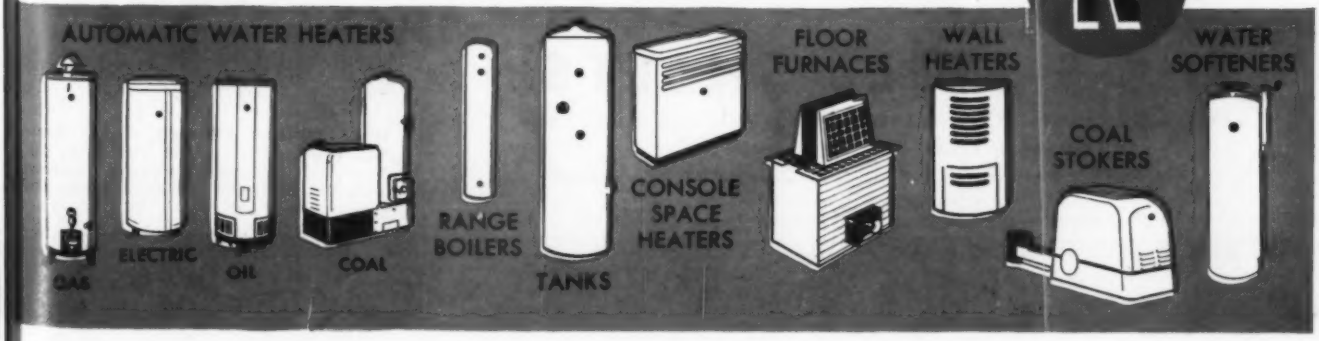
You'll be glad to know, for instance, that the new Rheem 600 Automatic Gas Water Heater pictured above is equipped with the Rheem-built 100% Control. This truly vital safety feature utilizes the Baso-Thermal Magnetic principle... guarantees positive shutoff of both the main gas supply and the pilot gas supply if the pilot light goes out. The Rheem 100% Control is designed and manufactured for use with all types of gases.

We've told you to expect even higher quality in Rheem postwar products, and that's what you'll find—in every appliance in the complete Rheem line.

RHEEM MANUFACTURING COMPANY

General Sales Offices

New York • San Francisco • Los Angeles • Chicago



GOOD FORMING QUALITIES

STEEL SHEETS with good forming qualities contribute to the efficient, profitable operation of your shop. They result in better jobs . . . enable you to turn out more of them . . . in shorter time . . . with less waste of material.

U·S·S STEEL SHEETS are noted for their superior forming qualities. Uniform in surface and flatness, they may be bent, rolled, cut and stamped. Available to you are such specially processed, special purpose sheets as Galvanized, Galvannealed, Long Ternes, Hot and Cold Rolled Steel, Copper Steel and Stainless Steel. Within this group you can obtain sheets that are highly resistant to corrosion, rust and acids.

But, workability and durability are not the only reasons for using U·S·S Steel Sheets. They are the best-known, most widely advertised sheets in the industry. Your customers know that the familiar U·S·S Trademark stands for highest quality. Thus, jobs done with U·S·S Steel Sheets are easier to sell . . . assure lasting customer satisfaction.

And, remember, you can get all of your sheets from one convenient source of supply. That's a time and money saver, too. See your nearest U·S·S Steel jobber today.

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Export Company, New York
United States Steel Supply Company, Chicago, *Warehouse Distributors*

U·S·S STEELS FOR SUCCESSFUL SHEET METAL WORKMANSHIP

U·S·S GALVANIZED STEEL for sheet metal structures requiring the added protection of a zinc coating.

U·S·S COPPER STEEL to give twice the atmospheric corrosion resistance of regular steel at little additional cost.

U·S·S DUL-KOTE—A dull-surfaced galvanized sheet and U·S·S PAINTBOND—a Bonderized, galvanized sheet, both specially prepared for immediate painting and better paint adherence.

U·S·S HOT-ROLLED AND COLD-ROLLED STEEL to provide the basic advantages of steel, plus maximum economy, in accordance with the needs of each individual job.

U·S·S STAINLESS AND HEAT-RESISTING STEELS to assure high resistance to corrosion and heat, and to reduce weight.

U·S·S VITRENAMEL — Sheets designed especially for porcelain enameling.

U·S·S LOW-ALLOY, HIGH-STRENGTH STEELS to resist corrosion and increase strength-weight ratio.

USS STEEL — UNITED STATES STEEL

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

UNITED STATES STEEL

"NOW I KNOW WHAT A REAL STOKER IS!"

39 North 8th Street
Richmond, Indiana
Phone 6174

U. S. Machine Corporation
Lebanon, Indiana

Gentlemen:

I believe you will be interested in learning of my experience with another make of stoker and a Winkler Stoker the past two years.

I purchased this other unit for installation in my residence at 1308 North A Street in October 1943. Much to my disappointment, however, this stoker did not live up to the claims advanced for it and I received none of the benefits that I had expected.

I struggled along with this other stoker until the last of March this year at which time I had it replaced with one of your Winkler Stokers —now I know what a real stoker is and how much pleasure it can be.

The Winkler has performed perfectly and has not required a single service call. I think your automatic transmission, which does not have a shear pin, is worth more by itself than any other complete stoker. Our fire never went out until we turned the stoker off for summer and actually I do not dread the coming winter because I know that I can depend on my Winkler to keep the house nice and warm under all conditions. It shoves those clinkers aside like they were feathers and goes right on giving complete satisfaction in every respect. I believe the highest recommendation I could give you would be to point out that I have just had the second Winkler Stoker installed in my place of business.

I would most heartily recommend a Winkler to people who are planning on replacing their present stoker, as well as to others who have not yet purchased a stoker. The Winkler is tops in every way and I will be glad to give you permission to use this letter in any way you desire.

Sincerely yours,

G. E. BRANT (signed)

Winkler Distributors get an astonishing amount of sales-making publicity which costs them nothing! As illustrated by the letter here, Winkler owners go out of their way to tell others of Winkler performance and dependability. *One sale leads to another!*

Let's look at the reasons why—

In every detail of design and construction, the Winkler is engineered to give the most efficient and carefree heating. The exclusive Winkler "Inter-Plan" Drive, for example, typifies the advanced engineering of the entire stoker. Its interplanetary gearing develops *extra power* which enables a Winkler to operate under conditions which might ordinarily mean a breakdown.

All working parts of a Winkler are designed, machined and assembled in Winkler plants with the same careful precision which won five War Production Awards. Throughout, the Winkler is built of heavy weight and extremely durable materials, with every feature which assures *full*, not partial, benefits from stoker-firing.

FULLY AUTOMATIC TRANSMISSION—NO SHEAR PIN!

MATCH THE WINKLER FRANCHISE IF YOU CAN!

The Winkler Franchise offers the two essentials of profitable stoker merchandising—a product that challenges comparison—and an organized Merchandising Plan which bores straight into today's tremendous stoker market.

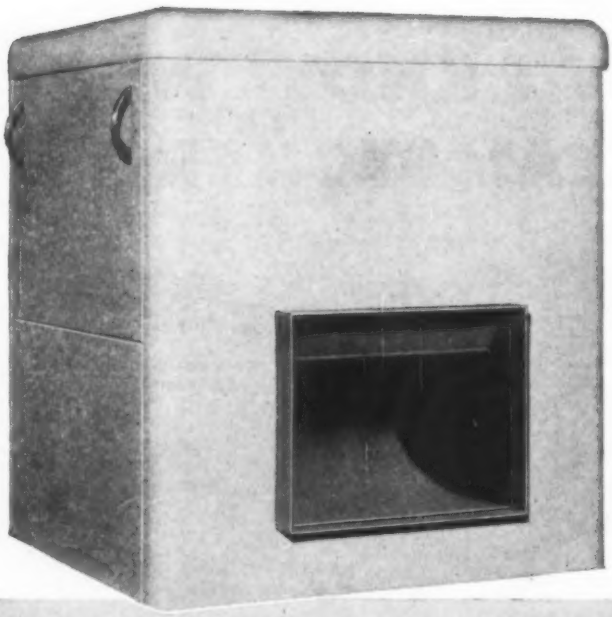
The Winkler Basic Business Set-up eliminates hit-or-miss, resultless selling tactics. It provides Winkler Distributors with complete facilities for profitable operation—trains them thoroughly in the methods which have given Winkler its dominating position. The overall program includes the support of strong National Advertising, plus participation in the Winkler Two-for-One Advertising Fund for distributors' local use. Write today for full information.

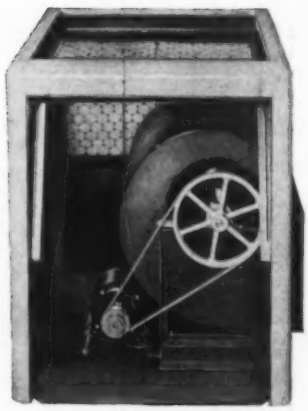
Winkler Perfection De Luxe Model

Winkler No. 15 Commercial Self-feed Model

WINKLER
fully automatic STOKERS

U. S. MACHINE CORPORATION
DEPT. L-6
LEBANON, IND.





Simply engineered, the USAIRCO Blower-Filter Unit is easily assembled. Sturdy, air tight cabinet; greater filter area; quiet operation; efficient air delivery all characterize USAIRCO units . . . maximum protection from rust and moisture. A significant blower-filter value!

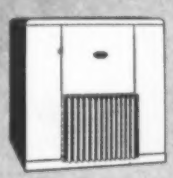
New Features...New Values!

USAIRCO BLOWER-FILTER UNITS

THERE'S a ready profit for you when you install the new USAIRCO Blower-Filter Unit for your warm air furnace customers. The tremendous market now existing for blower-filter cabinets, both for reconversion jobs and new furnace installations, is yours for the taking. And, the new USAIRCO equipment will make it easier for you to cash in on this business.

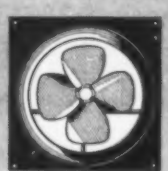
A well-built warm air furnace blower-filter unit makes satisfied customers . . . home owners who help you sell more installations. You can depend on USAIRCO equipment to meet every requirement of your customers, for keen beauty and smooth performance is skilfully engineered in an economical unit.

Plan now to get your share of the profits in installing USAIRCO Blower-Filter Units. Manufactured in six standard sizes with capacities from 800 to 6000 CFM. Ask for your copy of Catalog No. 440BF.



EVAPORATIVE COOLING UNITS

CENTRIFUGAL BLOWERS



PROPELLER FANS

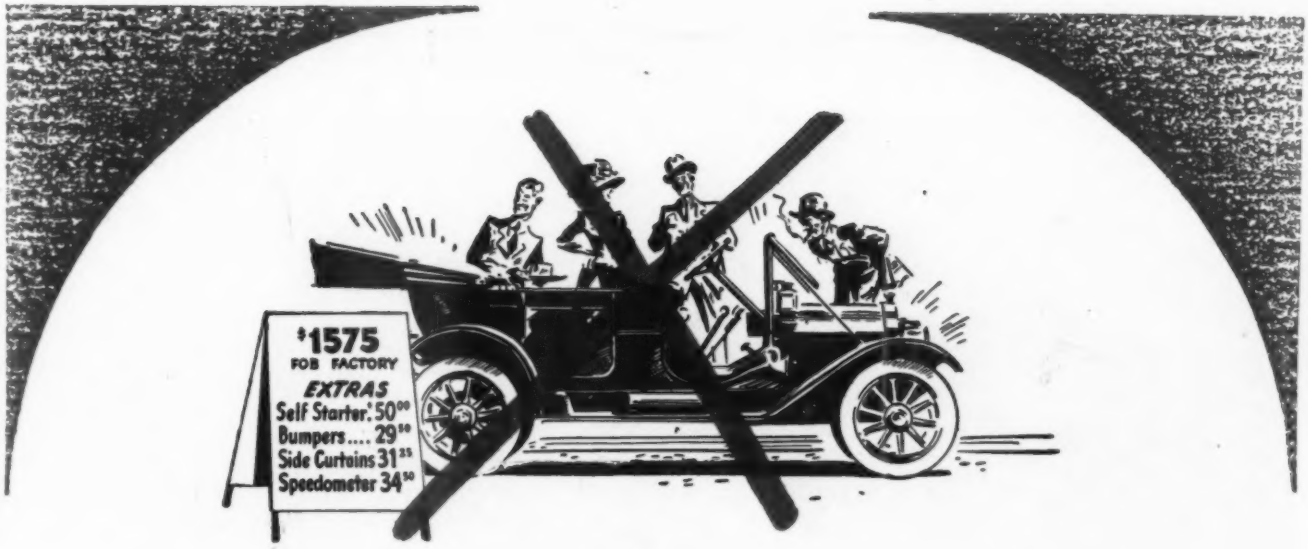
UNIT AND BLAST HEATERS • COILS
BLOWER WHEELS • SCROLL HOUSINGS

United States Air Conditioning Corporation

NORTHWESTERN TERMINAL • MINNEAPOLIS, MINNESOTA

USAIRCO Air Conditioning EQUIPMENT

Manufacturers of the most complete line of air handling equipment



"EXTRAS" are out of style sell COMPLETE heating satisfaction

EXPENSIVE EXTRA GADGETS are going out of the heating business, too. Your customers want a completely engineered job that will deliver a constant flow of fresh, gently-moving warmth throughout the home, all day long. No furnace is complete that requires "extras" to make it *heat uniformly.*

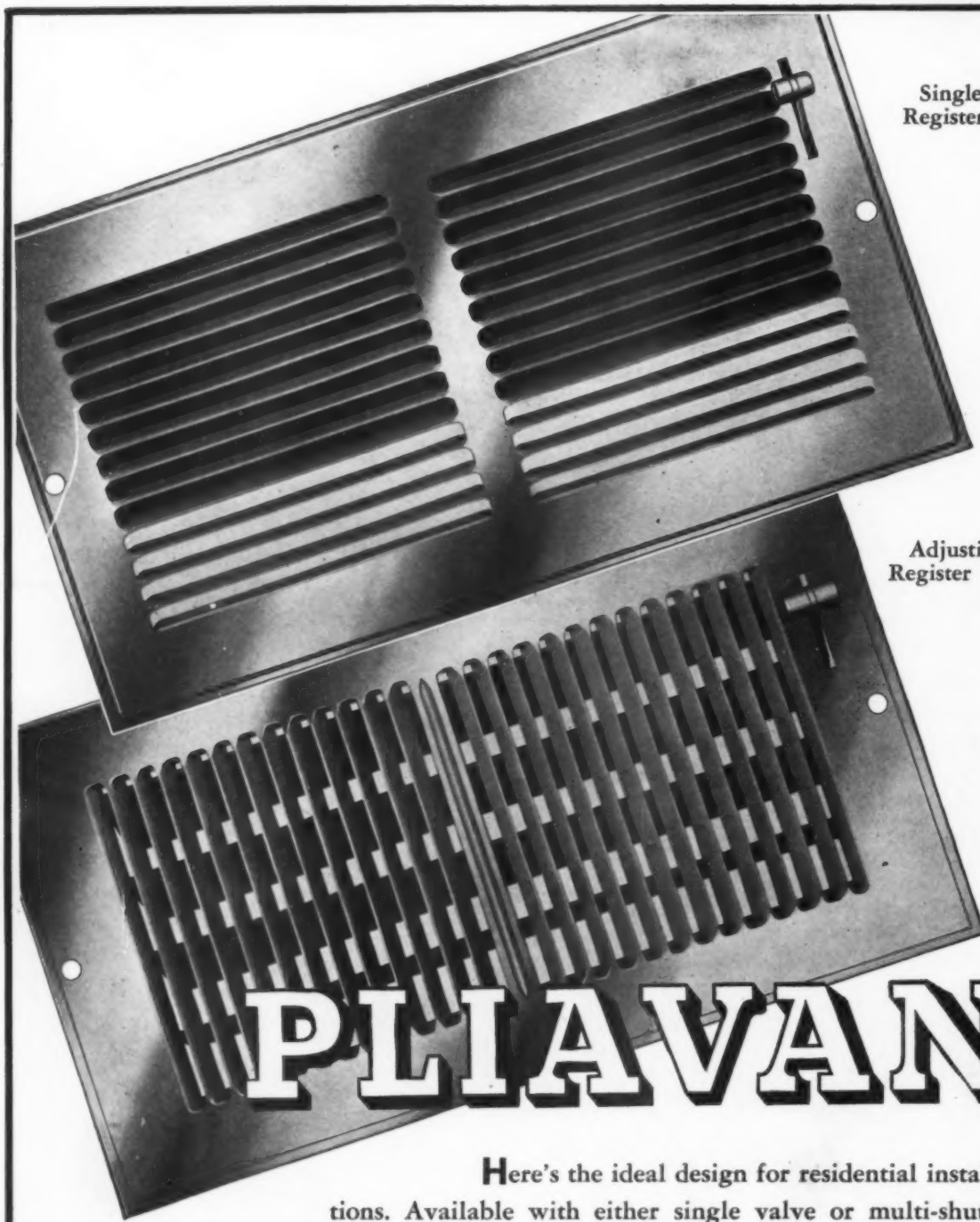
Superfex is a complete heating system—all necessary controls are built right into the unit. Automatically adjusting for changes in the weather, the Superfex system also controls . . . automatically . . . the three stages of pilot, low and high fire. This, together with the synchronized blower, results in healthful, uniform floor-to-ceiling comfort which makes wasteful "stop-and-go" heating look mighty old-fashioned.

IMPORTANT! The Three-Stage principle on which the Superfex Furnace operates is no "long-haired" experiment. Winter-tested in more than a thousand homes, the system really works. Write today for "Super Comfort with Superfex". . . a new booklet explaining the Three-Stage heating principle built into Superfex Furnaces.

PERFECTION STOVE COMPANY • 7796-F Platt Avenue, Cleveland, Ohio

Superfex
FURNACES

A COMPLETE LINE OF WINDOW AIR CONDITIONING FURNACES FOR OIL AND GAS



Single Valve
Register No. 21

Adjustiblade
Register No. 42

PLIAVANE

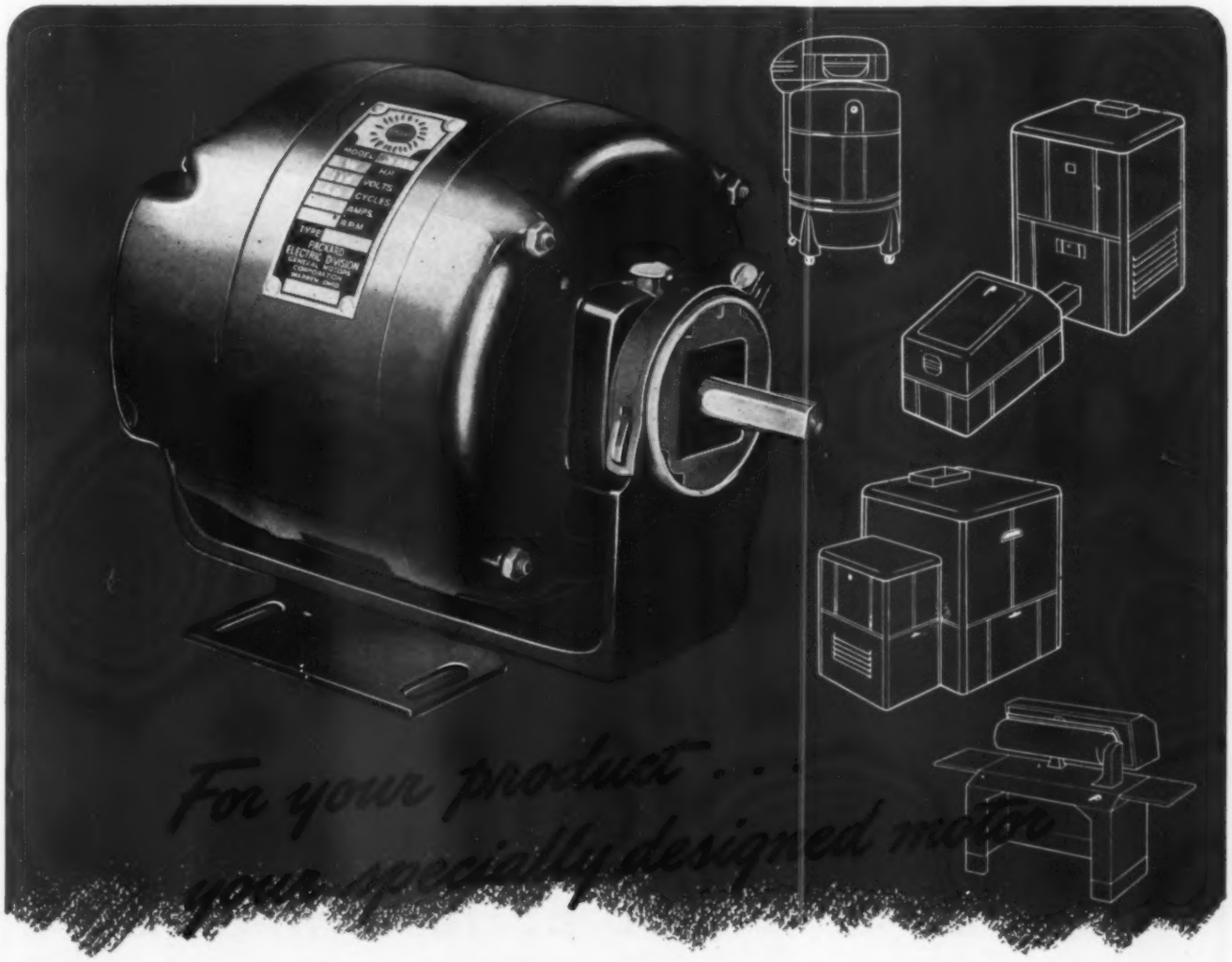
Here's the ideal design for residential installations. Available with either single valve or multi-shutter dampers and with four different frames to meet the requirements of any type of installation. The pliable bars allow for any required deflection of the air stream. Attractive in appearance. Economical in cost. Write for details.

TUTTLE & BAILEY

INCORPORATED

NEW BRITAIN, CONNECTICUT

PACKARD SUNLIGHT MOTORS



In the long run, the success of your product may depend to a considerable extent on its motor. If the motor is right, your product will perform better . . . help keep customers satisfied, reduce complaints and corrective service, and help increase the number of new sales and repeat orders.

It is easy to insure that your product's motor is the proper one for the job. Packard Electric engineers can design the right motor for you . . . the right size, with correct running characteristics and proper construction for long, trouble-free service . . . the motor that fits your product's needs accurately. And you can have it volume-built at low cost in the same Packard plants that produce motors for many other nationally known appliance manufacturers.

Your motor will have the basic quality features characterizing all Packard Sunlight motors: adequate torque for starting and operating loads; self-oiling, cast bronze journals to reduce friction and minimize servicing needs; copper wire of proper gauge for motor capacity; extra-heavy insulation to guard against short-circuits.

If you have a motor problem, let Packard Electric design the motor that can do the job best.

Packard
REG. U.S. PAT. OFF.

Packard Electric Division, General Motors Corporation, Warren, Ohio

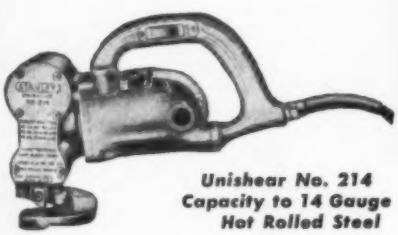
PACKARD SUNLIGHT MOTORS for: compressors . . . washing machines . . . power-driven bench tools . . . ironers . . . milk separators . . . milking machines . . . furnace blowers . . . stokers . . . oil burners . . . water pumps . . . ventilators . . . and many other applications.

DEPENDABLE APPLIANCE MOTORS FOR TWENTY-NINE YEARS

UNISHEARS

"Mighty Midget" Unishear
Capacity to 18 Gauge
Hot Rolled Steel

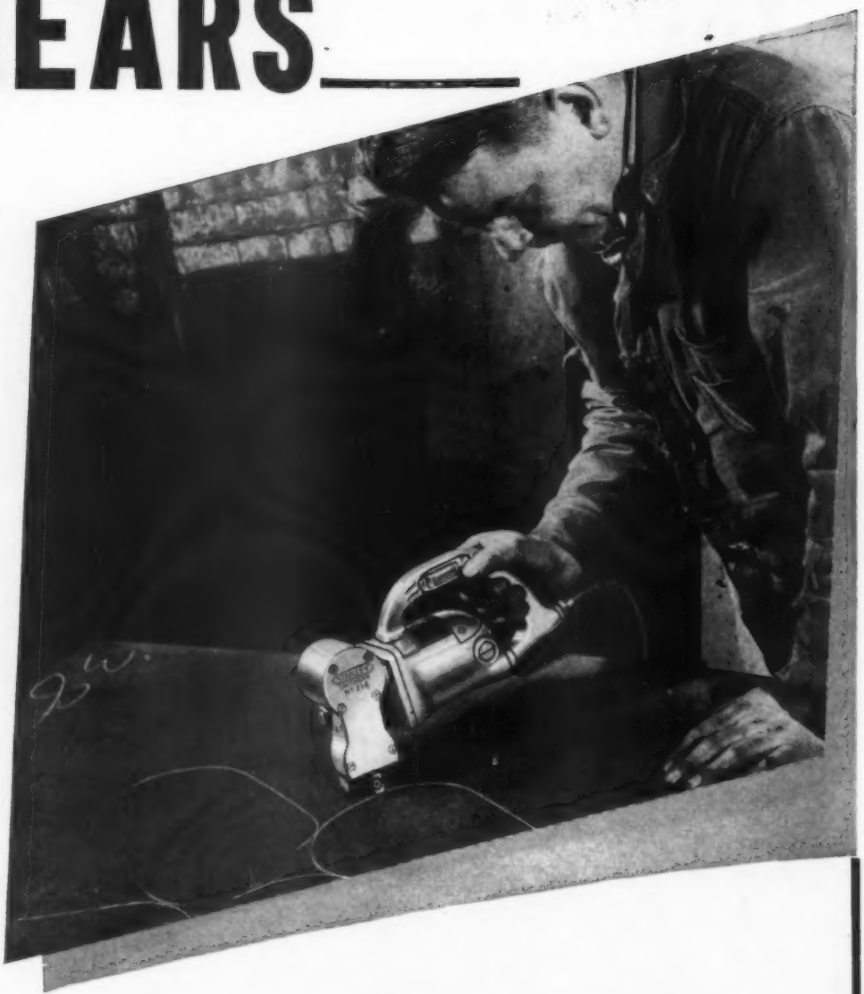
Unishear No. 16A
Capacity to 16 Gauge
Hot Rolled Steel



Unishear No. 214
Capacity to 14 Gauge
Hot Rolled Steel

Unishear No. 144A
Capacity to 12 Gauge
Hot Rolled Steel

Unishear No. 208
Capacity to 8 Gauge
Hot Rolled Steel



Five portable models to choose from

Speed and more speed – that's the order of the day in sheet metal work. Unishears will put this speed into your production – and do it with precision, too!

Stanley Unishears are compact and powerful tools that zip through hot or cold rolled steel or galvanized iron at 15 to 20 feet a minute as fed. Follow straight lines, curves, angles and cut notches with hairline accuracy. Can be used for inside cuts by simply cutting an entry hole inside the sheet.

Stanley portable models are available in five sizes as shown. Stationary models handle metal up to 10 gauge. Write for full information. Stanley Electric Tools, 131 Elm St., New Britain, Conn.

STANLEY

Trade Mark

SURRENDERS!

MAY 1945 GERMANY SURRENDERS

AUG. 1945 JAPAN SURRENDERS

SMOKE-BACK

SURRENDERS to Stok-A-Fire

JAN. 1ST. 1946

Stok-A-Fire engineering has conquered smoke-back . . . the greatest handicap to stoker satisfaction. This bugaboo of stoker dealers was not only responsible for 80% of consumer call backs, but resulted in the most powerful resistance against the entire stoker business.

The evils arising from smoke-back, such as the permeating acrid stench with its disagreeable effect upon the entire household, and the resulting extra effort to keep the home clean, kept the dealer in constant anguish from consumer complaints.

Stok-A-Fire smoke-back control has made this the new era for stoker dealers. THE ERA OF CAREFREE PAINLESS HAPPY SALES. The era of freedom from smoke-back complaints. Only Stok-A-Fire DESIGN could make this possible.

FACTS! FACTS! FACTS! FACTS!

AUGUST 1942

At this time, after 14 years of stoker manufacturing experience, while the industry was frozen, a great opportunity had arisen and we engineered the new Stok-A-Fire. It had outstanding revolutionary improvements far ahead of competitive makes. Smoke-Back Control; Coal Meter; Air Regulator; Rejector System; Unique Retort; Improved Hopper and other features that today have not been matched by any other stoker.

OCTOBER 1945

After 3 years of experimentation and field tests, we announced in August the New Stok-A-Fire to the dealers of America. The response was overwhelming. By October dealers everywhere applauded our SMOKE-BACK Victory. They found in STOK-A-FIRE the opportunity for amazingly increased sales because for the first time in history it gave them a stoker to sell, which eliminated this No. 1 consumer complaint.

DECEMBER 1945

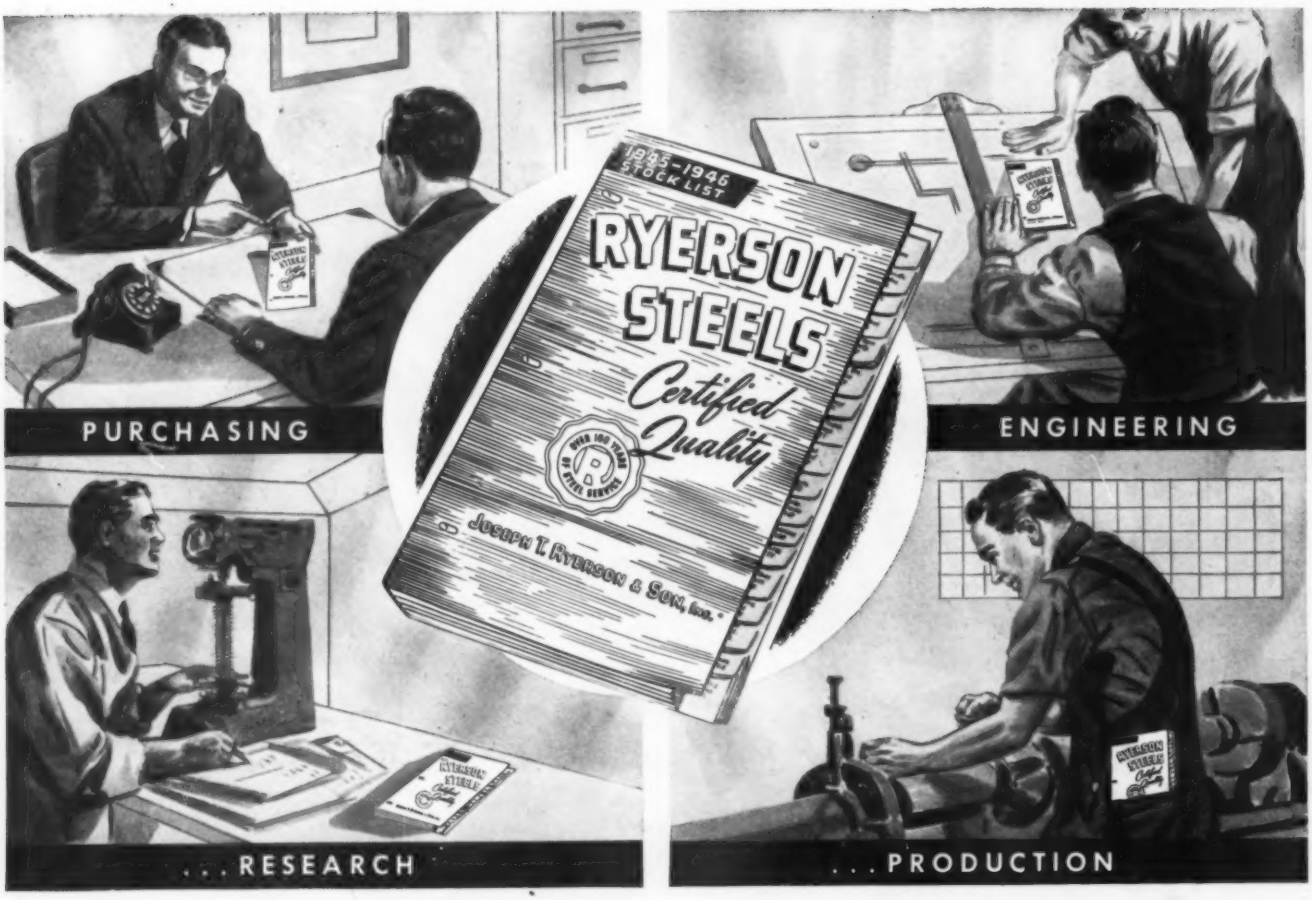
We have conducted a consumer survey in thousands of homes ALL OVER AMERICA, from Washington to New York, from Minnesota to Alabama—homes wherever STOK-A-FIRES were installed. Every owner was enthusiastic, none mentioned even a trace of SMOKE-BACK. Then we KNEW we had something really BIG. Now that Smoke-back is licked, the green light is on. Dealers achieve a happy relationship with their customers—at a profit.

JANUARY 1946

THIS is the year to cash in on our SMOKE-BACK Victory. . . . We invite dealers to investigate our profitable Stok-A-Fire proposition. We can prove to you how other progressive dealers have made BIG money from sales . . . and more important—FROM SATISFIED SALES

ACT NOW—WRITE US AT ONCE FOR DESIRABLE FRANCHISE OPPORTUNITY

Stok-A-Fire Co. 6506 OLIVE BOULEVARD SAINT LOUIS, MISSOURI



Are You Using this Steel Guide?

The Ryerson Stock List and Steel Data Book serves every department

Detailed information on Ryerson steel—descriptions, specifications, sizes, extras, etc.—is at your finger tips. In addition there are many pages of data covering: Average physical properties, AISI-SAE and NE steel compositions, Ryerson steel identification and other useful facts and figures—all in the new Ryerson Stock List and Steel Data Book.

It simplifies the work of every department in your company. With this complete steel guide, one order, one shipment, one invoice can often cover your warehouse steel needs.

Handy, pocket size . . . punched for your ring binder and index tabbed for quick reference, this book is your ready guide to steel specifying and buying for 1946. It is invaluable to the occasional as well as the regular steel user. Copies have been widely distributed, but, if you do not have one, contact our nearest plant.

Product information includes data on: Beams, Channels, Angles, Hot and Cold Finished Bars, Plates, Sheets, Alloy Steels, including Heat Treated and Special Alloys, Allegheny Stainless, Tool Steel, Mechanical Tubing, Boiler Tubes, Reinforcing Bars and Accessories, Inland 4-Way Floor Plate, Babbitt, Welding Rod, Bolts, Rivets, Metal Working Machinery and Tools, etc.

RYERSON CERTIFIED STEELS

Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

RYERSON STEEL

Quick Picture of 1946

American industry is standing, today, on the threshold of its first full year of the post-war era—the first year of what everyone hopes will be a long period of prosperity and full business activity. Behind us lie the war years and 1945 when, in the beginning, peace seemed remote only to resolve into swiftly moving events which ended the war.

Now industry and business face the tremendous task of making the peace the bright and vital victory the millions who sacrificed expect from us. But, though 1946 is only a few weeks old, it has already been demonstrated that the path to peace and prosperity may not be an easy road. Already business—and government—have found that past experience is of little help in solving the problems which truly are unprecedented in business history.

So our industry—and every other industry—is and must feel its way toward this hoped-for prosperity, encouraged because by all our accepted criteria the shortage of goods which make up America's standard of living has already reached the place where years of full production will be required to satisfy our needs.

1946 Potential Market

Only indirectly do the shortages of automobiles, refrigerators, clothing, furnishings concern us—but our industry is vitally concerned with the shortage of new housing; with the pressing need to repair and re-equip existing homes and structures; with the tremendous task of weather-proofing and re-equipping industrial and commercial structures for peace time production.

We accept the statements that perhaps 10 million new homes will be needed during the next ten years. We believe that fully another 10 million homes will want some of the products of our industry for repair and improvement. We acknowledge that things being as they are perhaps 400,000 new homes is about all we can expect in 1946. We accept that before American industry and commerce can get completely into its peace-time stride something like 600 millions of new construction in commercial buildings; 300 millions of new industrial construction; 400 millions of new construction in schools and colleges; 200 millions in new construction for hospitals and institutions; 150 millions of new construction in public buildings; 100 millions of new construction for churches; one billion dollars of new construction for hotels, apartments; and two billions of new construction for public works—will be required *each year* for something like a decade.

This, in brief, is the potential market from which our industry will get its peace-time contracts.

This is, indeed, an encouraging picture. It is a picture from which everyone—large or small—in our industry can expect to get a share sufficient to keep busy to the limits of our facilities. And, unlike some boom times in the past, this gigantic total of work waiting is scattered throughout every nook and corner of our country.

The Stumbling Blocks

Without much question, before we can enjoy this prosperity, certain problems facing us today must be solved. Three problems concern us most—(1) labor; (2) materials and equipment; (3) prices.

Unfortunately, the solution to each of these problems is not easy—we can't just hire more men; we can't just charge a higher price; we can't just look for a new source of supply. All three of these problems—and each of these problems individually—are involved in still other problems of radical social change which are being so highly publicized that we can add nothing to the discussion in a short summary of this kind.

Briefly putting each of these major problems in sharper focus: (1) labor—every man who can read in America is already swamped by the millions of words which have been written or spoken on the hundreds of phases of the labor problem. Our industry faces—(1) an alarming scarcity of labor and too few young men coming up; (2) an apparent loss in labor efficiency; (3) spreading demands for a higher wage per hour; (4) a coming demand for a shorter work week; (5) a great change in the basic thinking of labor leading to security of job and pay, a greater voice in management, and a larger percentage of the money we used to consider rightful employer profit.

As for prices (3) there is nothing different in the price situation as it affects our industry and the price situations in other industries about which literally millions of words have already been written and spok-

en. We do know that our manufacturers can't continue in business if they can't make a profit and our contractors won't be too anxious to offer service if the price permitted is too low to show a profit. We need sensible price adjustment.

The situation with number (2) problem—equipment and material shortages—warrants careful presentation because only through a careful study of expectations can the contractor plan his operations for 1946. To the best of our knowledge the following brief summaries apply to:

Heating Equipment

The question uppermost in the minds of heating contractors is—will we get furnaces and how many and of what kind, in 1946?

The answer very briefly seems to be—automatic heating equipment, both gas and oil, will be insufficient to meet the demands in 1946. The reason for the scarcity seems to be—there are not enough motors, controls, accessories in prospect to fill the orders already placed with manufacturers of furnaces. Also, these winter air conditioning units require light gauges of steel and steel of a quality and type which has been growing steadily scarcer during the last few months. Should there be further delays in production and should there be no price relief for the steel producer on this type of sheet then there can't be nearly enough automatic equipment.

Another headache which has been dogging manufacturers for the past two years is a scarcity of castings. Foundries are booked to capacity with orders for castings which require the least possible skilled workmanship—foundries face one of the toughest labor problems in all industry—it is only reasonable, then, for foundries to avoid orders for the type of castings required for furnaces. The situation is so desperate that many furnace manufacturers have given serious thought to castingless furnaces or at least furnaces with cast iron grates only. To switch from cast fronts, doors, etc., is not the easy trick it might seem at first glance—the experience is that formed doors, fronts, etc., require a knowledge many of our manufacturers just don't possess at the moment.

There Will Be Gravity Furnaces

The one bright spot seems to be—there will probably be enough gravity type, hand-fired coal furnaces to satisfy the needs of what new house construction there will be in 1946. Why? Because gravity furnaces need no motors, no controls, no wiring. And a gravity furnace is satisfactory with a round unpainted casing. It is the hope of the manufacturers that there will be enough light gauge galvanized iron in 1946 to case the gravity furnaces. Just to be sure of a casing some manufacturers are already experimenting with aluminum—higher in price per pound, yes, but plentiful and probably with a satisfactory life.

As to how many furnaces will be produced (all fuels, both gravity and forced), there is a startling lack of agreement among the manufacturers. Back in October when OPA invited furnace manufacturers to discuss a price increase, the concensus of opinion seemed to be production of cast iron furnaces in 1946 would be about that of 1942—about 150,000 units. Manufacturers of steel furnaces stated their production would be about that of 1941—about 270,000 units.

If these estimates of production were sound, then the industry should produce a total of 420,000 furnaces in 1946.

As stated, this is only a concensus opinion. Since that October meeting one or two estimates for 1946 have gone as high as 517,000 units (equal to 1941). And, contrarily, some estimates have been issued as low as 370,000 units.

Replacement Furnaces

Will 420,000 furnaces be enough? In view of the current difficulties with labor; with shortages of materials and equipment absolutely necessary for house construction, the house building industry is currently forecasting not more than 450,000 new homes in 1946. Applying pre-war percentages to 450,000 new houses, and assuming that most of these will be single family occupancy, 70 per cent of the houses will be heated with warm air furnaces. So, of the total 420,000 furnaces produced in 1946, 315,000 furnaces will be required for new houses and there will be 135,000 furnaces left for replacement.

If there will be only 135,000 furnaces available for replacement, 1946 will be the worst year yet experienced. Even during the war years the industry managed to get 200,000 to 220,000 furnaces set aside for replacement.

The above summary is definitely speculation. The picture can and probably will change if—(1) labor becomes satisfied and seriously goes back to work; (2) the OPA raises selling prices so that furnace manufacturers can pay high enough wages to attract workers away from other industries; (3) the OPA raises prices so that mills will produce sheets and plate, foundries can employ more men to produce more castings, accessory manufacturers can employ enough men to obtain full production; (4) the basic controversies which are besetting all industry are settled so that all industry can go seriously back to work.

Under present circumstances, most furnace manufacturers are applying a voluntary rationing system in order to give all dealers some share of each manufacturer's production. Orders in the hands of manufacturers have been for some time in excess of each manufacturer's production. Should orders increase and production fail to increase proportionately, this gap between demand and production can widen still farther.

Motors and Blowers

The growing scarcity of fractional horsepower motors stems, again, from price ceilings set by OPA. Motors require electrical steel. Electrical steel, in normal times was a small profit material—hence electrical steel was mostly produced by small mills. Now these mills find that each pound of electrical steel must be sold at a loss, so they are either stopping production or just coasting along.

About six months ago fractional horsepower motor manufacturers announced that they then had orders on hand for some 18 months production. Within the last few weeks—due to a lack of electrical steel—the motor manufacturers have placed all their customers (such as blower, oil burner, stoker manufacturers and others) on the old 1941 schedule. In other words, if a blower manufacturer bought motors from a motor manufacturer in 1941 he now is scheduled to get in 1946 the same number of motors he got in 1941.

If a manufacture did not buy motors in 1941, he now can't get on any motor manufacturer's schedule

1941 was a small production year for most manufacturers of blowers, oil burners and stokers. Today the demand for blowers, stokers and oil burners is at least four times as great at it was in 1941.

This publication understands that some blower manufacturers have told their customers—"we can't get motors; therefore out of every five blowers you order we can ship only one blower with a motor, the other four we must ship without a motor." There seems to be at least one case where this ratio is one blower with motor to every 20 blowers without motors.

The only way a blower manufacturer can supply motors with all blowers, is to buy motors at a premium price. But the blower manufacturer cannot charge his customer this premium—so he won't buy the motor. On the other hand, a dealer can pick up rebuilt, or used or new motors at premium prices and he can, in turn, increase his price—installed—by this same amount—this is permissible under OPA. Therefore, the only hope for large sales of packaged blowers is for the dealer to find his own motors.

Oil Burners and Stokers

Any hoped-for increase in production of oil burners seems stopped for the moment by the lack of motors and also a lack of transformers and certain porcelain parts.

In the light of the explanation of the motor situation above, there will have to be radical changes in prices all through industry before this situation changes.

The same situation applies to stokers, plus the fact that stokers require certain castings and sheet metal which is hard to get.

Materials

The shortages of sheet and plate and finished materials like galvanized iron are already so acute that under full production months will be required before a balance between supply and demand is reached. If the wage problem in the steel industry is settled quickly, it is probable mills can find sufficient help to get production back to normal quickly.

But before mills will feel inclined to attempt full production, the mills will want increased prices. The President has already taken one step in this direction. We do not know if his tentative increase is sufficient to be interesting—neither do we know whether price adjustments are contemplated for particular types of material. For instance, a $4.00 per ton increase might be satisfactory for hot rolled black plate. But maybe a greater increase is needed for galvanized iron, or electrical steel, or for cold rolled sheet. Nothing has been said about this.

In general, according to government reports, the shortages which exist in steel also exist in copper and brass sheet and strip. These materials, says government, are extremely tight and are expected to remain so for many months.

Since we need copper and brass products not only in the mill form, but also in the form of finished equipment, it is likely that shortages here will be reflected widely in shortages of components our industry needs.

Accessories

The shortages of materials, the difficulties with labor, the problems of adequate price which have been described before, also apply to the production of registers and grilles, furnace and smoke pipe and to conductor and eaves trough. The overall picture here seems to be production at ⅓ to ½ of demand.

The manufacturers of these products, either because of location, or because of type of labor employed, and because of a high state of mechanization, thought they could, and quite likely can, get into full production if materials become available and if price increases are granted.

Regulations

Probably as surprising to the average business man as the end of the war, was the swift elimination of regulations which came with the end of 1945.

The following quick picture gives some conception of how great that change really was—at the beginning of 1945 industry and business were operating under some 9 general CMP regulations; under 27 priority regulations; under some 108 "L" orders; under some 133 "M" orders (one "M" order had 103 amendments, schedules, etc.); under 29 "P" orders. But this stupendous regulatory burden was only half the story—at the beginning of 1945 government had already revoked, allowed to expire, or discarded more than 1,300 orders, amendments to orders, schedules, etc.

Without doubt this gigantic and intricate conglomerate was necessary to win the war, but business and industry certainly heaved an atomic sigh of relief when the end was announced. WPB and its over and under agencies were replaced at the end of 1945 by the Civilian Production Administration whose job was announced as "a means to expedite reconversion and assist in breaking bottlenecks."

All that remains today of 1945's regulations—so far as our industry is concerned is CPA-541A—an application form for priority assistance in obtaining materials.

Conclusion

This summary is, in fact, a very quick picture of the situation which confronts the warm air heating-sheet metal contracting industry as 1946 begins. It is a confusing picture—to cope with it will require the utmost courage and patience.

In spite of the uncertainties, every manufacturing segment of the industry is proceeding to establish the most aggressive sales and merchandising campaigns in history. Improvements in current models and wholly new models are being and will be announced as the months go by. Every manufacturer and every contractor-dealer is keenly aware of the market potentials which exist in the millions of new homes we need so badly and in the millions more existing homes which require or will want improved equipment. Both manufacturers and dealers have great confidence and faith in the future of our industry and are alive to the responsibilities of keeping America comfortably housed.

If any one factor can be picked out as the key to the log jam it seems to be—price ceilings. Our industry hates inflation as much as any official in Washington—but if prime material and equipment producers cannot get labor for production because permitted prices won't allow higher wages; or won't produce because production is at a loss—then we face a decision—either we have some degree of inflation, with production, or we have no inflation, but no production. Which it must be remains for all industry—and government—to decide.

We Claim This Work!

As of January 1, 1946, the many types of work our sheet metal craft claims through jurisdiction are listed in the 23 sections of this article. This statement does not, however, cover the scores of special or local or temporary awards which are always in force throughout the country. A careful study is urged—too few operators know all the types of work our craft is authorized to do.

Section 1. This Association, chartered by and affiliated with the American Federation of Labor, the Building Trades, the Metal Trades and the Railway Employes' Departments thereof, and the Canadian Trades and Labor Congress, and thereby identified and known as the Sheet Metal Workers' International Association, has established and claims herewith for its members full jurisdiction over the manufacture, fabrication, assembling, erection, hanging, application, adjusting, alteration, repairing, dismantling, re-conditioning, testing and maintenance of all sheet metal work made of No. Ten (10) U. S., its equivalent or lighter gauge metals; said jurisdiction to include all flat, formed in brake or press, corrugated or ribbed sheets and all rolled, drawn, pressed, extruded, stamped or spun tubing, shapes and forms of plain or protected steel, iron, tin, copper, brass, bronze, aluminum, zinc, lead, german silver, monel metal, stainless and chrome steel and any and all other alloy metals of No. Ten (10) U. S., its equivalent or lighter gauge metals; together with all necessary or specified reinforcements, brackets, hangers, straps, plates, tees, angles, channels, furrings, supports, anchors, rods, chains, clips, frames, ornaments, trimmings, grilles, registers, castings, hardware and equipment, mechanical or otherwise, regardless of gauge, weight or material when necessary or specified for use in direct connection with or incidental to the manufacture, fabrication, assembling, erection, hanging, application, adjusting, alteration, repairing, dismantling, re-conditioning, testing and maintenance of all sheet metal work made of No. Ten (10) U. S., its equivalent or lighter gauge metal; said jurisdiction to also include the fastening of any and all materials and equipment specified in this jurisdictional claim, whether same be applied to wood, steel, stone, brick, concrete or other types of structure, base or materials, with full jurisdiction over the making of all connections, attachments, seams and joints, whether nailed, screwed, bolted, riveted, cemented, poured, wiped, soldered, brazed, welded or otherwise fastened and attached, and all drilling and tapping in connection with or incidental thereto.

Section 2. Any and all types of sheet metal foundation forms; wall forms; column forms; casings, mouldings; plain or corrugated domes; slab forms; flat, ribbed or corrugated sheet forms used in connection with concrete or cement construction; including sheet metal inserts to provide specified openings, also permanent column guards.

Section 3. Any and all types of sheets, flat, formed in brake, corrugated or otherwise formed or reinforced; and all rolled, drawn, pressed, extruded, stamped or spun sheets, shapes and forms of plain or protected metal specified for use in connection with or incidental to roofing, decking, flooring, siding, water proofing, weather proofing, fire proofing, for base and support of other materials, or for ornamental or other purposes.

Section 4. Any and all types of formed, rolled, drawn, stamped or pressed sheet metal shingles, sheet metal tile, sheet metal brick, sheet metal stone and sheet metal lumber, when specified for use as roofing, siding, water proofing, weather proofing, fire proofing or for ornamental or any other purpose.

Section 5. Any and all sheet metal work specified for use in connection with or incidental to steeples, domes, minarets, lookouts, dormers, louvres, ridges, copings, roofing, decking, hips, valleys, gutters, outlets, roof flanges, flashings, gravel stops, leader heads, down spouts, mansards, balustrades, skylights, cornice mouldings, columns, capitals, panels, pilasters, mullions, spandrils and any and all other shapes, forms and design of sheet metal work specified for use for water proofing, weather proofing, fire proofing, ornamental, decorative or display purposes, or as trim on exterior of buildings.

Section 6. Any and all types of sheet metal buildings including hangars, garages, service stations, commercial or storage buildings of permanent or portable design, whether manufactured, fabricated, or erected to meet specific requirements or whether constructed of standard patented units of flat, formed in brake, corrugated, rolled, drawn, or stamped sheets, shapes and forms of plain, protected or ornamental design.

Section 7. Any and all types of sheet metal marquise, vestibule and storm door enclosures, window frames, mouldings, cornice, pilasters, mullions, panels, sills, heads, awning covers, corner posts, stops, light troughs, reflectors and deflectors, bulletin boards and any and all types of sheet metal signs specified for use in connection with or incidental to display windows, building fronts, store fronts, and theater fronts; for fire proofing, weather proofing, water proofing, ornamental or display advertising purposes.

Section 8. Any and all types of sheet metal bill boards, bulletin boards and sheet metal signs specified for use on the exterior of buildings for advertising and display purposes, and any and all types of sheet metal signs and bulletin boards specified for use in connection with or incidental to the equip-

ment and operation of theaters, hotels, hospitals, apartments, factories and other types of buildings of interior or exterior design.

Section 9. Any and all sheet metal work used in connection with or incidental to the equipment and operation of grain elevators, mills, factories, warehouses, manufacturing plants and commercial buildings, including elevator legs and enclosures, chutes, hoppers, carriers, spiral, automatic or other conveyors, package chutes, fire apparatus and enclosures for same, pipes and fittings, dampers, machine guards, cyclones, fans, blowers, dust collecting systems, ovens and driers, heating, ventilation, industrial hygiene control, air conditioning, and all other types of sheet metal work and equipment, mechanical or otherwise, in connection with or incidental to the operation thereof.

Section 10. Any and all types of sheet metal window frames, sash, bucks, doors, frames, trim, picture moulding, frieze moulding, wire moulding, chair rail and base, panels, wainscoting, mullions, pilasters, sills, permanent vestibule partitions, smoke and fire screens, portable and permanent screens and partitions for hospital, office, commercial and factory use; toilet, shower and dressing room partitions; elevator and other types of enclosures specified for use as equipment and interior trim.

Section 11. Any and all types of sheet metal ceilings with cornices and mouldings of plain, ornamental, enameled, glazed, or acoustic type; and any and all types of side walls, wainscoting of plain, ornamental, enameled, or glazed types, including sheet metal tile; and the application of all necessary wood or metal furring, plastic or other materials, to which they are directly applied.

Section 12. Any and all moving picture booths and any and all sheet metal work in connection with indirect lighting systems, including side lights and foot lights in theaters, auditoriums, schools, etc.

Section 13. Any and all types of sheet metal work specified for use in connection with or incidental to direct, indirect or other types of heating, ventilating, industrial hygiene control, air conditioning and cooling systems; including risers, stacks, ducts, fittings, dampers, casings, recess boxes, outlets, exhausts, ventilators, frames, grilles, registers, fans and motors; air washers, filters, air brushes, housings, air conditioning chambers, unit heaters, cabinets, and any and all other sheet metal work and equipment, mechanical or otherwise, in connection with or incidental to the proper installation and operation of said systems, and all duct connections to and from same.

Section 14. Any and all types of warm air furnaces, including assembling and setting-up of all cast iron parts, sheet metal hoods, casings, wall stacks, smoke pipes, trunk lines, cold air intakes, air chambers, vent pipes, frames, registers, dampers and regulating devices, and all other sheet metal work and equipment, mechanical or otherwise, in connection with or incidental to the proper installation and operation of same.

Section 15. Any and all types of sheet metal smoke pipe, elbows, fittings and breeching for boilers, heaters and furnaces. All sheet metal lagging and jackets on engines. Any and all sheet metal drip pans, exhaust pipes, heads, safety flues, and other appliances in connection with or incidental to boilers, heaters, furnaces, engines, machinery, etc.

Section 16. Any and all materials substituting sheet metal piping, ducts, risers, or fittings, made of, fabricated of, or manufactured of any substance, composite substance, or materials of any matter, designed as a substitute for sheet metal of No. Ten (10) gauge or lighter, and all other piping, ducts, risers, fittings of any other substance or material used in processing or as ducts for carrying off air, vitiated air, steam, gas, fumes or corrosive fumes.

Section 17. Any and all types of sheet metal furniture and equipment, lockers, shelving, library stacks, warehouse, factory and storage stacks, bins, etc., specified for use as equipment or incidental to the operation of offices, factories, libraries, hotels, apartments, schools, banks, public and semi-public buildings, and for general commercial use.

Section 18. Any and all sheet metal work in connection with or incidental to the equipment and operation of kitchens in hotels, restaurants, lunch rooms, drug stores, banks, dining cars, public and semi-public buildings, including ranges, canopies, steam tables, work tables, dish washers, coffee urns, warming closets, sinks, drain boards, garbage chutes and incinerators, refrigerators and all other sheet metal work in connection with kitchen equipment or refrigerating plants.

Section 19. Any and all types of sheet metal work in connection with or incidental to laundry equipment and machinery, washers, clothes dryers and laundry chutes.

Section 20. Any and all types of sheet metal work and coppersmith work in connection with or incidental to the manufacture, fabrication, assembling, maintenance and repair of automobiles, aeroplanes, pontoons, dirigibles, blimps, and other types of air craft and equipment, and any and all types of air craft hangars.

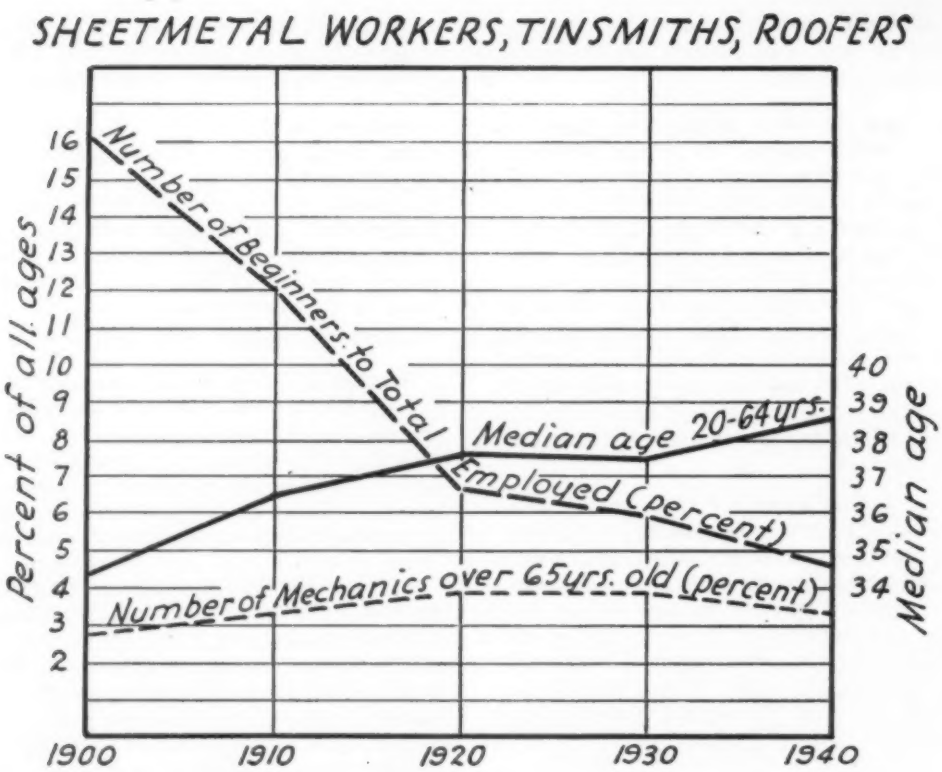
Section 21. Any and all types of sheet metal chandeliers, lamps and lighting fixtures, ornaments, decorations, household ware, and miscellaneous articles for use in factories and mills; any and all types of sheet metal switch boxes, cut-out boxes, panel boards, cabinets and speaking tubes.

Section 22. Any and all types of sheet metal badges, buttons and novelties with all hard or soft soldering in connection with same by flame or other method.

Section 23. Any and all types of sheets, tubing, pipes and fittings, used in connection with or incidental to coppersmithing work, regardless of gauge or material. The manufacture, fabrication, assembling, erection, maintenance, repair and dismantling of all said coppersmithing work, including bending of tubes, pipes and coils and all pipe fitting in connection with or incidental thereto, and the testing of equipment when installed to insure proper operation.

Section 24. Any and all sheet metal work and coppersmithing work in connection with or incidental to building, maintenance and repair of ships and boats.

(Continued on page 206)



The sheet metal trade is not as badly off as some crafts, but we have too many old men (3.3 per cent) and too few young apprentices (4.7 per cent) and the "average" mechanic is showing up older each year. These are the signs of coming decay—now is none too early to start corrections.

Needed Immediately — 5000 Apprentices!

THE current concern over the lack of apprentices in the sheet metal industry, and throughout the whole construction industry as well, stems largely from the individual employer's realization that he does not have young men coming up in his shop plus the fact that there is a similar lack in all the shops within his area.

The sheet metal industry, working through the Apprenticeship Committee of the Sheet Metal Contractors National Association and through local and state associations as well, has, in cooperation with union labor, put in motion certain plans to attract young men to our trade. The Federal government also, through the Federal Apprenticeship Training Program of WMC, has initiated a national apprenticeship training plan for the construction industry. Various plans now in operation have been reported in AMERICAN ARTISAN.

For the construction industry as a whole it has been estimated that at least 250,000 apprentices should now be in training if the industry is to have enough mechanics to handle the building volume expected in the next five to ten years. To induce this number of young men to learn construction crafts calls for a selling program not yet even conceived.

Considering that from three to five years training is considered necessary to teach an apprentice to be a mechanic, a rapid building apprenticeship training program is vitally important. Any neglect in starting such a program will find the construction industry where it was in the 1920's, when unskilled workers and permit men were called upon to perform the duties of skilled building workers.

This situation is graphically summarized by a published survey made by the Apprentice Training Service, Bureau of Training, War Manpower Commission (Technical Bulletin No. T-121). For the sheet metal contracting industry the chart shown with this article sums up the situation and the problem in a most graphic manner.

Picture of Sheet Metal Craft

In explanation of the chart is the following:

"This group is considerably younger on the average than the construction trades as a whole, despite the fact that it contains a relatively large proportion of skilled workers 65 years of age or older. It is significant, however, that the average age of the group has increased from 34.4 years in 1900 to 38.6 years in 1940. This shift is obviously in some degree at-

Sheetmetal Workers, Tinsmiths, Roofers

Census year	Total skilled workers (male)	Apprentices (all ages)	Beginning group (Apps. and workers thru 19 years of age) as percent of total[2]	Old-age group (65 years of age and older) a percent of total[3]	Median age of group 20-64 years of age (years)[4]
1940	121,572	(3,000)	(4.7)	3.3	38.6
1930	110,457	(3,400)	(5.9)	3.8	37.5
1920	89,401	3,066	6.6	3.9	37.6
1910	76,187	(2,300)	(12.0)	(3.6)	(36.4)
1900	77,904	1,307	(16.0)	2.6	(34.4)

[2]*All apprentices, regardless of sex, plus all male skilled workers through 19 years of age, without correction for age unknown.*

[3]*All male skilled workers 65 years of age or older, without correction for age unknown.*

[4]*Males only, excluding apprentices, and without correction for age unknown.*

tributable to the fact that the percentage of beginners (apprentices and workers under 20 years of age) has been allowed to drop off from 16 per cent in 1900 to 4.7 per cent in 1940. The beginners are as yet in excess of the aged. If, however, to the aged we add those who die, retire, or leave the trade prior to age 65 years, we find that the replacements are fewer than the losses. For the time being, the population is relatively stable. It contains, however, the seeds of decay, as evidenced by the steady and insidious effects of age on the average of the group as a whole. If sufficiently forewarned, we should immediately prepare to train more apprentices in this trade. Instead of the 3,000 apprentices reported as of 1940, we should be training at least 8,500."

Why No Apprentices?

While the apprenticeship problem in the sheet metal industry is our primary concern, we are also interested in some of the overall facts disclosed by the survey. The committee has this to say about the study and the problem:

"Bulletin T-121 was prepared as a result of the report issued on the January 12, 1945, Conference of the General Committee on Apprenticeship for the Construction Industry.

"The Conference agreed there are several deterring factors to the progress of apprenticeship in the construction industry. 'Among these,' the report said, 'is the urgent need for factual information regarding the overall requirements of the industry—the percentage of yearly accessions needed in each trade to replace separation due to various reasons, as contrasted with the number now entering as bona fide apprentices; the number of workers who leave the trade annually; the average age of present workers—all these statistics must be collected and disseminated not only to present a clear picture of the national situation, but to arouse local interest and action to do a job that must be done to maintain and expand the construction industry.'

"Not all of the information requested by the committee is available at this time (June, 1945). It is expected that as the national apprenticeship program grows, and when complete registration of all apprenticeship programs and individual apprenticeship agreements is accomplished, a yearly inventory can be published showing accessions to the skilled trades. Meanwhile, a study of estimates based on Census data permits a report covering in part the committee's wants.

"The purpose of the charts in this booklet is to illustrate the problem of advancing age in the skilled trades. The most significant curve on each chart is that showing shift in the average age of skilled workers in the trade. (Fifty per cent of the group are older and 50 per cent younger than the median age.)

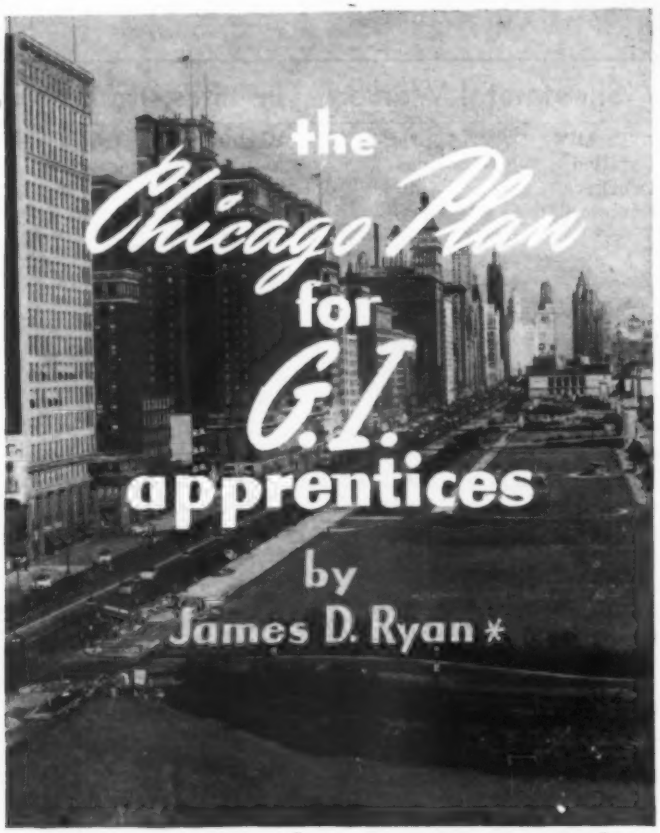
"In view of the fact that the relative size of the old-age group remains fairly stable, the median age curve should be compared with the 'beginner group' curve. It is apparent that the two are possibly related. They suggest that the average age is rising in large part because the proportion of beginners has been allowed to drop off, and that, therefore, to obtain a balance a larger number of apprentices needs to be trained.

Too Many Oldsters—Too Few Youngsters

"Most significant of all, however, is the relationship between the 'beginner' curve and the 'old-age' curve. If those workers 65 years of age or older were suddenly to retire as a group, several of the trades would not have enough beginners to replace them. If, in addition to these older workers, those who die or retire from the trade before age 65 years were added (the number is not known, but is probably large), the insufficiency of replacements would be even more obvious. If projected plans assume in addition an expanding construction economy, the actual ratio of replacements becomes completely inadequate."

The sheet metal industry, as shown by the chart, still shows more beginners than the old age group (65 years and older), which is good, but the margin is pretty thin. Some trades (painters, masons, plasterers, carpenters, cabinet workers) show fewer beginners than mechanics over 65 years of age. It might be claimed that our industry is, therefore, in pretty good shape, but again the margin is too thin to take care of any increase in construction activity.

The crux of the problem has been stated by the committee above—we should be training at least 8,000 apprentices a year instead of the 3,000 boys who were in training in June, 1945.



THE preliminary report recently submitted to the Senate by the committee to study small business in relation to manpower contains many recommendations which are identical with those of the Chicago committee studying the necessity for more apprentices to keep stride with the added building needs of the Chicago area. This Chicago study was taken up, if not before, at least independent of and without knowledge of, the Senate Committee program.

The need for not only apprentices but for journeymen mechanics also during the war was acute. To begin with, Chicago's very efficient Washburne Trade Apprentice Training School was practically depleted of students who joined and were inducted into the Armed Service. This was particularly true of the younger mechanics, the process leaving in our hands only a residue of elderly manpower.

Furthermore, since distance lends enchantment to the view and the grass is always greener far away, many of Chicago's gypsy journeymen wandered to coastal cities on the strength of rumors of overtime and long employment. This further reduced the available number of skilled men.

Returning servicemen with medical discharges, along with those unfit who were not inducted, were the only types of manpower the industry could hope for. To fill our requirements we had to employ any and all that might enter our industry, and these were few.

Inducements for Veterans

To solve this perplexing problem, we in Chicago were compelled to devise attractive inducements which would draw large numbers of discharged veterans, from which we might finally make a fairly good selection. It was believed that offering ample propositions would attract not only casual job seekers but, more desirably, those sturdy and studious youths hunting a life vocation. At this time we had in Chicago about 1,500 journeymen, some old, to be sure, but mostly skillful. The number of indentured apprentices was negligible, possibly 15.

The prewar Chicago apprentice training was for a period of five years. The beginning wage for an indentured apprentice was about 45 cents per hour for the first year, 56 cents per hour for the second year, 68 cents per hour for the third year, 88 cents per hour for the fourth year, and $1.26 per hour for the fifth year.

The boys in service had been reading sensational newspaper stories of factory jobs paying $100 to $150 per week for unskilled help. Prompted by such exciting reports, discharged boys returned seeking the fabulous $100 per week. We were at a loss to know what to do. However, we temporized and offered to union or nonunion honorably discharged veterans, any and all who were acceptable, and virtually all were, the following arrangement:

Veteran Wage Scale

A four year plan with a sixty day probation period. The first year $1.00 per hour, second year $1.10 per hour, third year $1.25 per hour, the fourth and final year $1.40 per hour. It was also required that the veteran go to trade school two nights a week on his own time, his schooling to continue until he passed a satisfactory examination; also, that he make twenty fittings per year on his own time under his employer's supervision. At the expiration of four years and with these conditions and terms followed, he should be declared a journeyman mechanic.

A number of our apprentice members who were in the armed services and had had maybe six months, one year or two years' apprentice training returned with

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**Secretary-Treasurer, Sheet Metal Workers' Union Local No. 73, Chicago, and Secretary, Joint Arbitration Board and Joint Apprenticeship Committee.*

honorable discharges and appeared before the Joint Apprenticeship Committee. The full committee determined their rating, taking into consideration the apprentice's previous training, such additional training as he had acquired in the service, his years in service, his apparent adaptability, maturity and meritorious behavior. Some first year apprentices were rated as second year or third year or maybe fourth year. During these examinations the G. I. apprentice and his designated employer were present, both agreeing to the decision of the Board.

Those who had no training whatever in sheet metal work were started mostly as first year G. I. apprentices at $1.00 per hour. However, those who had done sheet metal work or sheet metal maintenance were rated according to their merits. For instance, one boy assigned to a ventilating contractor was rated for the fourth year at $1.40 per hour although he had no sheet metal training prior to the war. The Board thus put only twelve months' time between his immediate discharge rate and journeyman's pay of $1.85 per hour.

Plan Gets Results

This veterans' program proved so effective that in two months we were saturated with applications. The plan got some publicity from the Federation News, and a Chicago newspaper showed pictures of some twenty veterans along with the officers of the apprenticeship committee. The Veterans Administration and other interested bodies were enthusiastic, all of which drew an increasing number of veterans to our association chambers seeking assignment.

Old Apprentices Now Leaders

Of course, under this plan we are offering premiums to these G. I. veterans. But we are doing so because we believe that in a short time profitable results will accrue from these trained men. It is a fundamental fact that boys, like anything else, must be cultivated. Something must be put into them in order to get something out of them. We know that graduate apprentices are today the guiding geniuses of our trade. They fill foreman and supervisory capacities and other positions in our shops and offices. For instance, among our large air conditioning concerns like Narowetz Heating & Ventilating Company, Lawrence Bain is stocksharer and superintendent at large, and James Mraz is employment and shop manager; O. A. Wendt Company has Louis Musy-Verdel, Paul Manta, Ernest Bozmansky and Frank Wietzke, all job supervisors; Herbert H. Davis Company has Robert Thomsen as superintendent; and Western Ventilating Company has Conrad Wick as employer and superintendent—all erstwhile apprentices.

William Kuechenberg of the R. B. Hayward Company hit the jackpot, moving from apprentice through superintendent to the presidency of the R. B. Hayward Company. Edward Andrick, superintendent for the Hayward Company, was also an apprentice. There are many others like Harvey Ziehm, who superintended the construction of warships at Seneca, Ill. Last, but not least, Joseph Kaberlein, the sheet metal instructor at the Washburne Trade School, was himself an apprentice at the R. B. Hayward Company. It does not mean, of course, that all graduate apprentices will ascend to superintendencies, but give any one of them a blueprint and he will do the job.

Experience has proved that our country, or any successful country, or the family, or the community is poor and weak, or healthy and powerful, in proportion to the physical and mental training of its boys and girls—the ultimate people.

The regular indentured apprentice boy in Chicago goes to school one whole day, eight hours each week, with pay from his employer, this schooling to run through four years—175 days, all told; the fifth and last year of his indenture is without schooling. This, of course, differs from the G. I. plan in which the G. I. apprentice goes to school two nights per week on his own time, making 20 fittings per year as a display of progress and proficiency, his apprenticeship running through four years instead of five years.

It is safe to predict that this plan can be successfully operated in any town where promising applicants are available if the plan is sufficiently liberal and desirable and offers a substantial future to the boy indenturing himself under contract to take up a life's work.

Apprenticeship Committee at Work

The Chicago Apprenticeship Committee is registered with the United States Department of Labor, and two representatives of the department sit in at all meetings of the Joint Apprenticeship Committee for observation and in advisory capacity.

The Board is composed of nine members (with alternates) from the employers' side and three from the side of labor, making a total of twelve members. The chairman is selected from the employers' group and the secretary from labor. Three employer associations are represented on the board—Air Conditioning Contractors Alliance, Ventilating and Air Conditioning Contractors Association of Chicago, and Sheet Metal Contractors Association of Cook County. Joseph J. Kaberlein, sheet metal instructor at the Washburne Trade School, participates in the board's meetings in an advisory capacity.

Following is the apprenticeship committee's original plan and the subsequent recommendations.

Original Plan

Following the regular Joint Apprenticeship Committee meeting of May 9, 1945, at which time Chairman Searle appointed a committee of five, namely, Mr. Moffitt, Mr. Kuechenberg, Mr. Burghoffer, Mr. Kalvog and Mr. Ryan, to make arrangements and adjustments in wages and conditions to meet the needs and economic necessities providing for the satisfactory placement of honorably discharged men in the United States Armed Service with whom the Sheet Metal Workers' Apprenticeship Committee may be concerned.

For this purpose, a special meeting of the committee was called to order May 16, 1945, at 1120 Builders Building.

After recommendations were offered and arguments submitted by all sides, an agreement was finally arrived at, agreeing upon the following wages and conditions for ex-service men taking up employment in the sheet metal industry:

The wages for the first year will be $1.00 per hour, second year $1.10 per hour, third year $1.25 per hour, and the fourth and final year $1.40 per hour.

With these further conditions is an obligation that the employe attend school one or more nights a week during the school term, on his own time.

With an added provision that he makes at least twenty fittings a year, on his own time, under his employer's supervision.

His schooling to continue until he has passed a satisfactory examination.

(*Continued on page 240*)

Dollars and Cents Ceiling Prices On Heating Service Are a Possibility!

OFFICE of Price Administration's announced intention to seek approval of an overall ceiling price on new homes has been getting front page headlines all over the country. The storm of protest was great enough to stop this move until the President announced a revival of consideration just before Christmas.

But OPA is not standing idle. Every contractor knows that he must price his services on the same labor cost or charge that was used by the contractor in March, 1942, plus any authorized increase in labor rates up to October, 1943.

Example: If your March, 1942, labor rate was $1.25 per hour and is now $1.35, here is a job as priced by OPA:

Material	$100.00
Labor (March, 1942, rate), 100 hours	125.00
	$225.00
Regular markup (March, 1942), 30 per cent	67.50
	$292.50
Profit (March, 1942, rate), 10 per cent	29.25
	$321.75
Plus difference in labor rate March, 1942, to Oct. 3, 1943, 10c per hour, 100 hours	10.00
	$331.75

On top of this regulation, the OPA for several months past has been going into certain areas and, under the authority of Revised Maximum Price Regulation 251, setting up an actual *dollars and cents* price for a given service. For instance, in certain areas (Memphis, Tenn.; Newark, N. J.; Dallas, Tex.; Phoenix, Ariz.; San Francisco, Cal.) the OPA has set up such dollars and cents prices for a variety of installed roofing and siding products and applications. The disparity in these ceiling prices has been so great that the roofing industry has raised hell, but has obtained no relief.

This attempt to set dollar and cents ceilings on roofing products is not a totally haphazard policy—it is part and parcel of a well formulated plan to get price ceilings on all service businesses. And the OPA is not going to stop with the roofing industry.

OPA is moving in on the heating industry.

As of October, only one such area dollars and cents ceiling has been applied in the heating industry, but OPA frankly admits that it is receiving at its local, regional and Washington offices consumer complaints of excessive prices charged for heating service and OPA intends, wherever such complaints multiply, to slap down an area dollars and cents ceiling.

The one area OPA now ceilings is in Idaho and Washington. So that contractors may be forewarned of OPA's thinking and intentions we publish, following, the order putting the dollars and cents ceiling into effect in Idaho and Washington and also the order in full.

OFFICE OF PRICE ADMINISTRATION
SAN FRANCISCO REGIONAL OFFICE
REGION VIII

OPINION ACCOMPANYING ORDER NO. G-13 UNDER REVISED MAXIMUM PRICE REGULATION NO. 251

CONSTRUCTION SERVICES AND SALES OF INSTALLED BUILDING MATERIALS

The accompanying order establishes maximum dollars-and-cents prices for the sale of plumbing services in Northern Idaho and in the State of Washington except for that area in which such maximum prices are already established by Order No. G-7 under Revised Maximum Price Regulation No. 251. This order is issued under Section 9 of that regulation which authorizes the Regional Administrator to issue orders of this nature establishing prices not in excess of the general level of prices otherwise fixed by the regulation.

The purpose of this order, as with other orders of this kind, is to simplify pricing methods for both buyers and sellers by providing either definite maximum prices or definite methods from which such prices may be readily ascertained. In the issuance of this order, to insure fairness to all sellers concerned, the Regional Administrator has consulted with members of the industry and with other persons who have been in a position to supply information as to existing maximum prices and practices.

The pricing method adopted by this order is one which makes maximum prices dependent upon the hours of labor worked by each category of workman, namely journeyman, apprentices, and others, and on the type of labor involved, i.e., straight time, overtime, or holiday labor. Also included in the pricing method is a means of determining a maximum allowance for materials, such allowance being made dependent upon the prices published in Moore's Price Service and the seller's March, 1942, prices. Incidental provisions are made for the determination of working hours, for minimum charges, for use of special equipment, and for mileage allowances. These provisions, it is anticipated, will make appropriate allowances without impairing the effectiveness of the order.

The maximum prices established by this order are generally fair and equitable and do not exceed the general level of prices established by Revised Maximum Price Regulation No. 251, and for this and the other reasons stated are consistent with the Emergency Price Control Act of 1942, as amended, and Executive Order No. 9328.

Issued this 12th day of October, 1945.

BEN. C. DUNIWAY,
Regional Administrator.

Program Is Under Way

The latest information from OPA is that the following steps in this program are already being taken:

1. The present program of pricing contract services is being pushed vigorously, and the Branch is attempting to simplify procedures so as to provide the field offices with better analytical tools.

2. Procedures are being developed for translating the present retail lumber regulation into community

dollar-and-cents pricing. A pilot study is already under way to test these procedures.

3. Test studies are being set up to determine the best methods for community pricing of masonry materials, roofing, insulation and glass, as well as for millwork.

4. A regulation is being written to establish nation-wide dollar-and-cents prices for some hardware items, and for others to establish margins which the field offices can translate into dollar-and-cents prices.

5. A similar regulation is being prepared for pricing plumbing and heating equipment.

6. As soon as the pilot studies and new orders have been prepared, instructions and authorizations will be sent to the field offices for establishing community prices. We hope that there will be a relatively small number of cases in which circumstances will make it impossible to establish dollar-and-cents prices, but in such instances flat margins or over-riding prices can be fixed. In those instances in which over-riding ceilings are used, the seller will be compelled to compute his ceiling prices under existing regulations with the limitation that in no case may such ceilings exceed the over-riding ceiling for that area.

The time table for "refrigeration, plumbing and heating" is as follows:

Phase 1: Groundwork: Ends Sept. 1st: Initiate margin survey on distributors of refrigeration, plumbing and heating.

Phase 2: Development: Ends Nov. 1st: Continue collection and analysis of margin data on distributors of refrigerators, plumbing and heating equipment.

Phase 3: Full Development: *Continuous:* Issuance of distributors' regulation on refrigeration, plumbing and heating, covering retail sales. Retail prices to be shown by invoice notification and pre-ticketing where feasible.

Initiate and extend community pricing on refrigeration, plumbing and heating, to cover *installed sales* and to cover retail sales of items under margin control.

(Italics are ours.)

If any of us thought OPA was a war emergency agency, the cat is now out of the bag, however, in "Phase 3:—*continuous.*"

Here's the Order in Full

OFFICE OF PRICE ADMINISTRATION
SAN FRANCISCO REGIONAL OFFICE
REGION VIII

ORDER NO. G-13 UNDER REVISED MAXIMUM PRICE REGULATION NO. 251

CONSTRUCTION SERVICES AND SALES OF INSTALLED BUILDING MATERIALS

Plumbing & Heating Services in Washington and Idaho

For the reasons set forth in an opinion issued simultaneously herewith, and under the authority vested in the Regional Administrator of the Office of Price Administration by Section 9 of Revised Maximum Price Regulation No. 251, it is hereby ordered:

(a) **Geographical Applicability:** This order applies to sellers located in Northern Idaho County, and in the State of Washington with the exception of Clark, Cowlit, Klickitat, Skamania, and Wahkiakum Counties, which are covered by Order No. G-7 under Revised Maximum Price Regulation No. 251. This territory is divided for pricing purposes into the following three areas:

AREA 1: In the State of Washington: Kitsap County and the Seattle Metropolitan area, the boundary of which proceeds as follows: Commencing at the northwest corner of Woodway Park eastward along the northern boundary line of such park and along an extension of said line to a point north of the northermost point of Lake Ballinger; thence due south to Lake Ballinger and southward along the western shore of said lake to the northern boundary of King County: Thence eastward along said county boundary to a point north of the easternmost limit of Kenmore; thence due south to Lake Washington; thence southward along the western shore of Lake Washington to the southernmost point of said lake; thence due east to a point north of the easternmost limit of Renton; thence due south to Renton and southward along the boundary of said city to East Valley Road; thence southward along said road to a point midway between the northern and southern boundaries of Section 8, Township 22 North, Range 5, East Willamette Meridian; thence due west to Puget Sound; thence northward along the eastern shore of Puget Sound to the point of beginning.

AREA 2: The remainder of the part of the State of Washington covered by this order and lying west of the crest of the Cascade Mountains.

AREA 3: The remainder of the part of the State of Washington covered by this order and lying east of the crest of the Cascade Mountains; and the following Counties in the State of Idaho: Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latch, Lewis, Nez Perce, and Shoshone.

(b) **Maximum Prices:** The maximum price of plumbing and heating services in the areas described above is the sum of a charge for labor, the maximum price of the materials used, and such other charges as may be permitted by this order. The maximum charge for labor shall be the sum of the number of hours of labor performed in each category multiplied by the maximum hourly rate applicable to that category, as provided by subparagraph (b)(1). The maximum price of the materials used shall be determined as is provided by subparagraph (b)(2). The maximum prices established by this order include all expenses; no fees, commissions, or other charges, as for rental or use of equipment or other incidental services, may be charged except as may be otherwise specified in this order.

(1) **Maximum Labor Charge:**

(i) **The maximum hourly rate** shall be either the rate in Column A or the labor cost per hour multiplied by the percentage in Column B, rounded out to the nearest 5 cents, **whichever is lower:**

	IN AREA 1		IN AREA 2		IN AREA 3	
	Col. A	Col. B	Col. A	Col. B	Col. A	Col. B
Journeyman Plumber	$3.00	170%	$2.75	160%	$2.50	155%
Apprentice Plumber, semi-skilled and common labor	2.00	150%	1.75	150%	1.50	150%

(*Editorial Note: The wage rate for journeymen sheet metal worker in Seattle is* $1.695 *per hour. Steamfitters and plumbers,* $1.745 per hour.)

(ii) **Overtime:** If overtime work is performed for which employees are actually paid 1½ or 2 times the straight time or normal wage rate, then in determining the maximum hourly rate for such work the hourly rate stated in Column

A may be increased by 1½ or 2 times, as the case may be. However, the maximum hourly rate provided by subparagraph (b)(1)(i) above, may not be increased unless the overtime work is performed at the customer's request and unless it is performed on Saturdays, Sundays, holidays, or between the hours of 5:00 P.M. and 8:00 A.M.

(iii) **Measurement of Hours:** The number of hours to be charged against any job is to be counted from the time the workman leaves the shop or the previous job (whichever is later) until he completes the job if he proceeds to another job, or until he returns to the shop if he proceeds there directly. For any job extending into more than one day, time in transit to or from the job may be charged only once. The hours for which charges are made shall not exceed those shown on the seller's payroll records nor those shown on any records or invoices which this order may require the seller to prepare or keep.

(iv) **Minimum Charge:** If a job requires less than one man-hour, there may be collected a minimum charge equal to the rate for one hour.

(v) A Journeyman Plumber doing his own work shall take as his labor cost the labor cost applicable to journeyman plumbers.

(2) **Materials:** The maximum price of any new material shall be the highest price charged for such material by the seller during March 1942, or the price published as of the date of issuance of this order, in Moore's Price Service, published by Moore's Price Service, Inc., Lloyd Building, Seattle 1, Washington, whichever is lower. The maximum price of any used materials or new materials which cannot be priced as provided above, shall be the seller's maximum price determined under the appropriate maximum price regulation.

(3) **Other Charges:**

(i) **Outside Sewer Stoppage Removal:** A minimum charge not to exceed $5.00 may be made for outside sewer stoppage removal subject to Revised Maximum Price Regulation No. 251, where total applicable hourly rate does not exceed this amount. If, because of employment of power-driven equipment, maximum hourly rates were in effect during March 1942, the records are available to substantiate such rate, then the same rates may be continued for this type of work.
(ii) **Out of Town Travel Expenses:** A seller who furnishes men on "out of town" work for the installation of building materials, shall be reimbursed to the extent of the amount he shall have to pay for travel expense and subsistence where this work necessitates the men being away from their home office. This item must be explained to customer prior to starting the work and invoiced properly as a separate item. Subsistence cannot be collected unless employer actually pays employee.

(c) **Definitions:**

(1) "Plumbing and heating services" means plumbing installation, repair and maintenance services, the sale of installed plumbing materials, and the installation of oil burners, feed lines, and automatic sprinklers. "Plumbing" means gas, water, and steam distribution or waste removal systems.
(2) "Labor cost" means the wage in effect on October 3, 1942, or wage rates which have been established by proper governmental agencies, but not in excess of the wage actually paid.

(d) **Jobs Selling for More than $350.00:** The maximum price for jobs in excess of $350.00 shall be the maximum price calculated under this order but shall not exceed a price calculated under Section 7 of Revised Maximum Price Regulation No. 251, using the sum of labor costs, material costs, direct costs, and a margin not exceeding the margin used on the most comparable job in the period January 1, 1939, to March 31, 1942, or, for sellers not in business in March, 1942, a margin not exceeding 30% of the sum of labor and material and other direct costs.

(e) **Guaranteed Prices:** A seller may supply plumbing and heating services covered by this order on the basis of a guaranteed price, the seller agreeing to charge a fixed amount, but such guaranteed price established by this order, and with respect to such job the seller shall keep records and furnish invoices as required by other provisions of this order.

(f) **Notification to Purchasers:** Every person making sales subject to this order shall furnish to the customer an invoice or sales slip on which he has itemized charges for materials and labor (including wage rates and hours of labor) and any other additions permitted by this order, and on which he has certified that the price charged does not exceed the prices permitted by this Order No. G-13 under Revised Maximum Price Regulation No. 251. In the case of sales subject to paragraph (d) (Jobs Selling for more than $350.00), invoices or sales slips need show only total charges for labor, materials, and other additions.

(g) **Records:** Duplicates of the invoices or sales slips required by paragraph (f) shall be kept by the seller at his place of business. Additionally, every person making sales subject to this order shall keep a permanent record of all employee's time and materials consumed for each job. The material used on a job shall be listed according to the trade names and shall be properly identified according to the serial number and grade. The job cards showing both the time and material consumed shall be signed by the employee. Travel time or other additions permitted in this order shall be clearly listed as such on the record. All of such records shall be available for inspection at any time by the Office of Price Administration.

(h) This order supersedes Sections 6, 7, and 8 of Revised Maximum Price Regulation No. 251 with respect to the plumbing and heating services to which it relates, except where it is otherwise provided herein.

(i) This order may be amended, corrected, or revoked at any time.
This order shall become effective October 21, 1945.
Issued this 12th day of October, 1945.

BEN. C. DUNIWAY,
Regional Administrator.

The OPA is not too cooperative in telling where areas are under dollars and cents price ceilings or where such ceilings are contemplated. Because this situation can become very serious, American Artisan requests its readers to write us if their area is under a dollars and cents price ceiling or if such a ceiling is rumored. The widest possible publicity on this OPA move seems warranted.

The Sheet Metal Contractors National Ass'n

Reports —

DURING 1945, when a national convention was prohibited and when meetings of fifty or more were impossible, the officers and directors of the Sheet Metal Contractors National Association have tried to keep association business up to date by holding board meetings and by attending, whenever possible, meetings of interested groups. In these activities the officers and directors have covered a considerable area of the country and have discussed association aims and progress with a satisfying number of interested contractors.

Certain impressions gained from these meetings seem worthy of special mention as the year 1945 comes to a close. First, there is the importance of the construction industry as a whole to the American economy. Every one in our trade and every one in the building construction industry should be proud of the fact that the building construction industry is one of the key industries—as construction goes so does much of the rest of business. In normal times the building construction industry furnishes employment for more than 8 million persons—all skilled craftsman getting the highest wages paid in industry. We are part of the second largest industry in business.

Sheet Metal Industry Important

Second, in the building construction industry as a unit, there is no craft which is more important and none which has so many points of contact with public health, comfort, safety, as has the sheet metal, warm air heating, roofing craft. This is readily understandable when we remember that in our craft there are contractors doing: residential warm air heating; residential air conditioning; commercial and industrial air conditioning; commercial and industrial fan blast heating; ventilating for comfort; ventilating for health; dust and fume collection and removal; manufacture of sheet metal products; roofing of all kinds from small residences to the largest factory structure; in short our craft protects the health and comfort of the man at work and of his family at home.

Strong Nat'l Ass'n Needed

As such an important and far reaching segment of the building construction industry it is only natural that there should have grown up during the years certain practices and standards which our craft believes should be improved or eliminated. The officers and directors, after a year of contacting groups believe that it will prove impossible for any one individual or any small group to rectify these improper practices. What is needed is a strong, united national association with strong, united state associations and local associations all affiliated for common purpose and improvement.

Third, there persists in the minds of certain persons and agencies in government; in the minds of certain employing or specifying groups like architects—that the sheet metal contractor is still a "Jack the Tinker" whose place of business is under his hat and whose only equipment is a soldering iron and a pair of snips. The truth is no craft in the building construction industry requires such a high degree of skill as does ours and no craft has any way near the investment in buildings, tools, machines, etc., as we have. And no craft furnishes the steady employment we do.

Strength Comes From Organization

Fourth, the whole building construction industry has just emerged from an era when regulation was applied down to the very smallest detail of our business. We have learned from this experience that no man by himself and no small local group can hope to cope with unfavorable legislation or protect themselves from unnecessary regulation without the powerful and continuous backing of a united industry. To advance and strengthen such a national organization has been the aim and purpose of all the officers and directors of the association—the success attained is seen from a membership in 42 states and rapidly approaching the 1,000 member mark in spite of all the hinderances to a normal and all-out campaign.

Committee Accomplishments

In 1945, a number of committees have either attained remarkable success or have laid a sound and enduring groundwork for activities which will get fully under way when restrictions of time and travel are removed. The Apprenticeship Training Committee, the Publicity and Membership Committee, the Architects and Engineers Cooperation (Bid Peddling resolution) Committee have all extended their progress and consolidated their gains.

Other committees—Labor Relations Committee, Legislative Committee, Manufacturers Cooperative Committee have had meetings and are ready to launch a full scale program just as soon as conditions permit.

The officers and directors of the Sheet Metal Contractors National Association believe that these advances in the face of war-time and war-end restrictions are worthy of consideration by every operating contractor in the industry. The officers and directors believe that the annual convention to be held in St. Louis, May 2, 3, 4 will bring together the largest gathering of contractors in the history of the industry.

With gratitude toward all who have helped to bring this progress about, the officers and directors take this opportunity to say—

"With pride in our craft; with honesty of purpose; united and in strength—let us go forward."

PATRICK S. VARDEN,
President

Arnold Kruckman's

Washington Letter

Dep't. of Commerce—Washington's Newest Ogre

THE things that have recently been happening in the Department of Commerce supply a dramatic illustration of the basic conflicts in Washington among those who themselves shape the way of the Government. These conflicts naturally are indices to the crises which have arisen the past weeks out through the country among workers, industrialists, and the rest of those who are the bone, sinew, brain and spirit of the United States. The unhappy aspect of the events in the Department of Commerce is that they have happened almost without touching the consciousness or awareness of the businessman, the worker, and the rest of the people out through the nation, whom they affect.

How It All Began

To understand what has happened it is necessary to go back swiftly to the time in 1912, on August 23, when Congress passed the Law which created the Bureau of Foreign and Domestic Commerce. The Act is known in legal references as 317 Stat. 407;5 U.S. C.—597. The Bureau of Foreign and Domestic Commerce was established in the Department of Commerce, which department originally had been brought into existence by a Law enacted on February 14, 1903, and which created a joint Department of Commerce and Labor. The point it is intended to stress is that Congress itself brought the Bureau of Foreign and Domestic Commerce into being by Law, and made the Bureau a thing that stemmed from the will of the people, formally enacted by its representatives in Congress. The Director of the Bureau of Foreign and Domestic Commerce, is appointed by the President, by and with the consent of the Senate. In other words, he cannot be kicked around by whoever is the Secretary of Commerce. The Director is himself responsible to the people of the United States through the President and the Congress.

If the point seems labored in emphasis, bear in mind that the semi-detached status of the Bureau of Foreign and Domestic Commerce has been recognized and carefully guarded, even though the succession of Secretaries and what-have-you during the New Deal years organized and re-organized and re-re-organized the Bureau every time some one had a fresh brainstorm. This reporter has counted seven re-organizations of the Bureau the past 12 or 14 years, but in no re-shuffle has it ever lost its legal identity as the Bureau of Foreign and Domestic Commerce, nor has it ever lost any of the functions given to it by the organic Law enacted by Congress. The point is particularly interesting because the Roosevelt Administration never was careful about meticulous compliance with the intents of Congress.

The Latest Reorganization

It is this aspect of the history of the Bureau of Foreign and Domestic Commerce which makes its present story such a dramatic example of what now is happening in Government. The other day the Washington Post, the "Thunderer of the Capital," announced: "The Bureau of Foreign and Domestic Commerce is being reorganized and broken up into five units. It will consist of an Office of International Trade, headed by Arthur Paul; an Office of Field Operations, whose chief will be Joseph Mack; an Office of Business Economics, headed by Dr. Amos Taylor, formerly the Director of the Bureau of Foreign and Domestic Commerce; and Dr. Taylor also is the head of the Office of Domestic Commerce. There will also be an Office of Small Business, headed by Dr. Wilford White; the five units collectively are planned to be more than twice the size of the Bureau of Foreign and Domestic Commerce. Several units of the Foreign Economic Administration are being merged into these five units." Further expansion has come from the dissolution of the Smaller War Plants Corporation, which was accomplished by an Executive Order. The banking and financial phases of the SWPC were merged with RFC, giving the Reconstruction Finance Corporation another $250,000,000 to distribute in loans and credit; and the rest of the varied functions of the SWPC were assigned to the Department of Commerce, including a substantial part of the operating funds provided by Congress for the SWPC. Naturally, the personnel and the funds and the powers of the agency, all have been absorbed by the Office of Small Business, one of the five parts of the former Bureau of Foreign and Domestic Commerce.

Wallace Is Not Trusted

The whole transaction connected with the transfiguration of the Bureau of Foreign and Domestic Commerce is a very vivid illustration of the Wallace thinking and system. For many months he has been trying to find a justification to get more money out of Congress. But Congress has never felt very warm towards Henry, the executioner of little pigs; and in

its innermost heart it has never altogether trusted Wallace. Not only is he regarded as far more radical and more ultra than the late President, but also he is deemed to have the late President's debonair and casual attitude towards the laws the Congress makes. Congress is said to have preferred Mr. Roosevelt, who was bold and frank in subscribing to the extra-legal aphorism: "What's the Constitution between friends?" You get the impression they feel Mr. Wallace gets his results by sort of sliding around and between the barbed wire of the Constitution, but that he likes to have his way about things fully as much as did Mr. Roosevelt. Taking into account that he is supposed to have an intimate relation with the CIO and its awesome PAC, and with radicals who are supposed to believe in every form of cooperative and cooperation, Wallace broadly is regarded by political Washington with more fear and less admiration than was Mr. Roosevelt. He has the same type of individualism, and he has the same faith in a socialized Government, so long as he can be its strong man. Also he is a deft master of professional politics, and he knows all the tricks of building himself up to a sustained interest in the public mind. And he has the instinctive theatrical gift of keeping his place in the spotlight.

All this and other equations have interfered with his long wooing of Congress for the funds to make his new version of the Department of Commerce tick. As it stands now he has announced the new set-up as an accomplished feat, but he has not explained how he has pushed aside the Constitutional structure made by Congress for the Bureau of Foreign and Domestic Commerce. In talking it over with the Unit chiefs of the Bureau he suggested that they regard the changes in about the same way they do their own annual domestic house cleaning when favorite chairs are found in unfavorable places. What he implied was that everything in the Bureau was still there but that the things might be used in a different way by different people.

Dep't of Agriculture Sets Pattern

Nor has he said anything about the plan to do in Commerce what was done in the Department of Agriculture, as the result of which a direct representative of the Federal Government is permanently placed in each of the 3,300 counties of the United States to distribute the largess of the Federal Government to the farmers of the nation. It is doubtful whether the average business man quite realizes what this integration of the Department of Agriculture means. There is actually no farmer in the United States whom the Department does not know and whom it cannot reach with amazing rapidity. The Department of Agriculture is really a complete and vast Government within the Federal Government. It has its own Office of Foreign Agricultural Relations, its own Office of Labor, Office of Investigatory (Police) Services, Insurance, banking organizations, transport services, Rural Electrification, credit organizations, laboratories, college facilities, research centers, it has radio services, motion picture services, speakers' bureaus, it publishes books, pamphlets, periodicals, it not only helps the farmer with every conceivable phase of the conduct of his business but it helps him to build, to send his children to school, to bring medical help into his home, to supply the domestic needs of his household. It probably would help him find a wife if he asked the County Agent.

The Department of Agriculture is powerful beyond the imagination of the average well-informed man in business or industry. It is so powerful that it practically dictates the way he shall go to the Cabinet Member who is appointed as Secretary of Agriculture. It virtually makes the terms on which the Sectary may function. Clinton Anderson, who came from Congress, found out all about this when he tried to reorganize the Department of Agriculture. The Secretary who tries to interfere with the machinery of the great inner Government simply finds that its wheels may grind him exceedingly small if he is too brash. The term "It" means a system, an almost impersonal group; men and women of ability, strength, and with experience in the Department, whose training and seniority and superior qualities and willingness to function in anonymity, make it essential that they remain in the Department for a lifetime to give it the continuity required by a great perpetuation establishment. They are the mortar and the bricks which hold the structure of Government together. As they see Government they must maintain the system even against the Secretaries who come and go. They are individually fine men and women, often people with selfless devotion to the ideals they serve. They are generally highly trained in the specific techniques of their special jobs. And they are seldom paid in proportion to the work they do.

The criticism of the Department is seldom aimed at the people who make it function; the question is about the *system*. In effect it is a communistic autocracy of schoolmen and schoolwomen resting on a great rural political base, involving farmers and producers of farm products and the great farm organizations.

The "Gag" Goes On

It is something similar to this system which the new idea in the Department of Commerce might bring into being. The nerve center would be in the Office of Small Business. It is interesting to note that the announced personnel of the new organization includes Herbert Parisius, who was a storm center in the Department of Agriculture during the Wallace tenure. There are other former officials of the Department of Agriculture, who have come into the Department of Commerce by way of the Foreign Economic Administration. These people, with an ache for anonymity, bottled up the channels of information in FEA about the most minor matter until the situation was on the brink of precipitating a full-dress Con gressional investigation. They apparently propose to initiate the same ultra hush-hush in Commerce. Word has already gone forth that no individual below the grade of Unit Chief may place his name on any communication; and the Department Order No. 11, outlining the organization and functions of the Office of International Trade, directs, Section 5, the Information Staff shall prepare and issue public statements, review all speeches, articles *and other information released*, which obviously effectively gags every one except the high command.

Wallace and his lieutenants are now endeavoring to eliminate reference to the Bureau of Foreign and Domestic Commerce from current discussion. They are attempting to indoctrinate the people of the Bureau in the terms of the new Offices. Legally, however, the Bureau must continue to exist until it is abolished by Executive Order. The President may issue such Order under the powers recently given him by the new Law enacted by Congress. Dr. Amos Taylor remains the Constitutionally appointed head of the Bureau until the Bureau is abolished. The

(*Continued on page 234*)

National Warm Air Heating & Air Conditioning Ass'n

Reports —

THE tools for creating a stronger and better warm air heating industry have been in the forging process the past two years by the National Warm Air Heating and Air Conditioning Association, and now these tools are ready to be put to work.

Early in 1946, an advertising, publicity and dealer-training program will begin. At the same time, a substantially expanded research program, in cooperation with the University of Illinois, is being launched. What are these new tools?

Advertising and Publicity

The advertising program will include full-page advertisements in a number of building- and architectural-magazines, to reach general contractors and contractors and architects; also advertisements in some national consumer magazines.

An attractive consumers' booklet and another designed for architects and general contractors will be prepared as soon as possible. According to present plans, there will be other dealer helps in addition to these booklets, such as posters, cardboard designs, envelope stuffers, etc.

Another service which should prove very beneficial, will be the release of consumer articles, through dealers, manufacturer and jobber members as well as direct to newspapers and magazines throughout the country, all setting forth the merits of Warm Air Heating, this type of activity being commonly referred to as "Publicity Releases."

A new department, including a qualified Advertising and Publicity Director, is being established in our Cleveland Office to administer and supervise this part of the program.

Dealer Service

It has long been the desire of the National Warm Air Heating and Air Conditioning Association to perform a better and more direct service to warm air heating dealers. This has now been made possible through the establishhment of a Dealer Division in the Association and through a large number of dealers who have become members and subscribers to the promotional program of the Association.

"Dealer Service" as planned, will include holding of schools for dealers, bulletins and correspondence service, in addition to making available various advertising helps and publicity releases. A qualified man will be engaged to direct all dealer activities through a separate department in the Cleveland office of our Association.

Research

Expansion of the Association's research program is two-fold:

1. A new warm air research residence will be erected in Urbana, Illinois, as early as possible in 1946. $17,500.00 of our Association's funds have been appropriated for this purpose. This new house will permit studies of forced-air and gravity heating heretofore impossible; also studies of panel heating.

2. The operational set-up has been practically doubled as compared to 1945, by the addition of two full-time assistant professors, plus additional part-time students.

Outlook for 1946

In 1944, 290,000 furnaces for all fuels were produced. Based on present estimates, 340,000 furnaces for all fuels will have been produced in 1945. (This estimate is based on production for the first nine months.)

I am of the opinion that if the material supply situation, including iron, steel, motors and controls, presently curtailed by shortage of labor, price ceilings, strikes and other factors, is substantially improved in the next few months furnace production for all fuels for 1946 can reach 500,000 units, or approximately 50 per cent more than produced in 1945. I am also of the opinion that there will be proportionate increases in production of registers, pipe and fittings, blowers, controls, humidifiers and other accessories.

There is every indication, as this is written, that there exists a strong backlog of orders for all Warm Air products. The current demand is strong, and it appears that it will continue to be so throughout all of 1946.

Frank E. Mehrings,
President.

Prices of Sections of "Practical Warm Air Heating"

Section No. 1—How to Make a Comfort Survey ..... Price 50c
Section No. 2—How to Check Frame House Construction ..... Price 50c
Section No. 7—Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems ..... Price 50c
Section No. 8—Yardstick for Classifying Warm Air-Winter Air Conditioners. Price 50c
Information and Sketch Blanks (Forms for gravity or winter air conditioning systems). Three sheets to a set ..... Sets of fifty $5.00
Work Sheets for heat loss calculation and selection of equipment .... Sets of fifty $3.00

Order with remittance should be sent to:
National Warm Air Heating & Air Conditioning Assn.
145 Public Square, Cleveland 14, Ohio

1946 Tax Economies

By Arthur Roberts

THE Revenue Act of 1945 reduces taxes on individual incomes, decreases corporation taxes and repeals the excess profits tax, the reductions applicable to taxable years beginning after December 31, 1945.

When you file your 1945 return on March 15, 1946, you figure your tax the same way you did the prior year.

The reductions legalized in the Revenue Act of 1945 become effective in 1946, not before. When filing the declaration of estimated tax for 1946 you may base your calculations upon the new rates. The current Act also repeals the capital stock tax, effective with respect to year ending after June 30, 1945, and the declared value excess profits tax, effective with respect to income-tax years ending after June 30, 1946.

Claim Deductions in Taxable Year

One thing the warm air dealer and sheet metal contractor must remember with regard to income tax is that the opportunity for savings is usually outlawed when filing time comes around because, then the taxable year is in the lap of history and it is too late to effect economies. The transactions have already transpired, the year is closed, and in many cases nothing can be done to get a better break on tax.

For example, if a taxpayer is on a cash and disbursements basis and does not pay certain bills during the taxable year, he cannot deduct for these expenses on March 15 even though has paid the bills in the intervening months. *He must deduct in the year of payment.* If a taxpayer fails to take other allowances, such as credit for bad debts ascertained worthless during the taxable year, or ample depreciation, he may be out of luck because the Treasury Department usually does not permit a taxpayer to recover in later years for such omissions.

This means that the taxpayer should consider tax economies during the taxable year and handle his transactions with tax savings always in mind. As long as he does not evade taxes, as long as he records everything honestly and does not try to conceal something, as long as he follows regulations and takes only legitimate deductions, he can handle his affairs so that his taxes are kept at minimum.

Modernize Accounting System

The basis of tax economy is accurate recording. The taxpayer who relies on memory is certain to omit entries that would give him deductions, particularly on small pay-outs, called petty cash items, which loom high over the year in this industry. Warm air dealers and sheet metal contractors should appraise their accounting systems now and make whatever changes are necessary to modernize them. You cannot effect maximum tax economies if your accounting system is below par.

Inventory is another important factor in keeping tax at minimum. Take inventory at cost or market, whichever is lower, on the last day of the taxable year. Keep a detail record of the count on inventory sheets. You can prepare such sheets on a typewriter or buy them in the stationery store with the necessary headings. Keep the sheets in a looseleaf file.

Those who have "ersatz" items on hand had better consider their value carefully. When new postwar items come to market, customers won't take the wartime substitutes and they must eventually be written down to actual value. When this depreciation occurs, the taxpawer can deduct for the loss. Carrying war items on hand indefinitely at original cost when their value has depreciated is unwise. Keep a detailed record of the items written down so that, at any time, you can justify the reduction in value.

Repairs on Own Building

Because manpower and materials were unavailable during the war, a lot of repair and maintenance work on the contractor's own premises was held in abeyance, and the taxpayer lost out on these deductions and paid that much more tax than he otherwise would have paid. Nothing can be done to retrieve this overpayment now. The next best bet is to make these deferred repairs as soon as possible so that you can deduct for them while the tax is still near peak. When taxes are high, it is wise to take every legitimate deduction or loss because these deductions effect bigger savings than when the taxes are low.

Also remember that if you make repairs and improvements at the same time and the contract is let as one job, the repairs are not deductible. Either make your repairs at one time, improvements at another time, or get separate bills for each class of work so that there is no question of your right to a deduction.

Take Machinery Depreciation

Those who were on war work may take depreciation on machinery that is now idle, or if it is abandoned, they may take a loss of value. The machinery must be sold or discarded to get this allowance.

With machines, non-mechanical equipment or trucks, you experience no gain or loss insofar as the tax law is concerned when you trade them in for new units. The trade-in is not computed in the tax calculation. Where the unrecovered cost of a truck is, say, $1,000 and the trade-in allowance offered is $1,500, this gain of $500 is not taxed, so a straight trade-in deal is desirable.

On the other hand, if the unrecovered cost on the books (the difference between the original cost of the truck and the value after write-downs for depreciation) is $1,000, and the trade-in allowance is only $500, the taxpayer cannot get credit for the loss of $500 if he effects a straight trade-in transaction, but

he can get the deduction if he sells the old truck for cash and uses the cash to buy the new truck. Then his books will show a loss of $500 between the unrecovered value of the truck and the selling price and the taxpayer can take a deduction for this loss.

Junk Obsolete Assets Now

If you have any business asset on hand that you will not need in the postwar period and the disposition of which will give you a tax deduction, then away with it while taxes are high. If you hang on to such units until taxes are lower, your tax benefits will be less. There is a tendency for businessmen to maintain the value of their assets at as high a figure as possible. At a time like this, such a procedure is costly. Inventory all of your business assets and appraise them in their relationship to postwar replacements and operations. Check over all stock on hand carefully and place a value on it consistent with its worth in 1946. Many businessmen are slow to re-value inventory downward and this lapse is costly from a tax standpoint.

Carry-Over and Carry-Back

You are permitted carry-over and carry-back losses for two years. Because of high productivity during the war, many businessmen have only gains to show from 1939 to 1944 so they haven't had much reason to make use of these economy regulations. With the war ending in 1945 and strikes, production came to a standstill in many organizations so it is probable that a number of concerns will show a loss for the first time in a number of years. In 1946 you can take credit for a 1945 loss under the carry-over provision; in other words, carrying over the 1945 loss to apply against a gain in 1946, thus reducing the 1946 tax.

Clean Up Renegotiation Now

With the war over, renegotiations under way or completed, it is possible to get a better perspective of wartime profits. Some taxpayers are taking a licking for war write-offs that is spreading their war profits pretty thin or, at least, with all the facts recorded now, they are finding that they filed tax returns for more income than they actually earned. Taxpayers should go over their war figures carefully, and if they find that the income on their returns was inflated, they may file amended returns in many cases. It all depends upon circumstances, but this angle is worth investigating.

Do Depreciating This Year

Depreciation and obsolescence harbor deductions for many businessmen at this particular time if they go thoroughly into the matter. Depreciation has always been more or less of a headache because, at best, it is an estimate. The Treasury Department, cognizant of this fact, in 1945 decided to make agreements with taxpayers on the rates they would be permitted to deduct, a written agreement covering five years. This should put some stability into a subject that has always been full of jitters for the taxpayer and the government. Consult the Revenue office in your district for information on this matter.

The Revenue Act of 1945 has eliminated certain features of the tax law that businessmen have criticized. The elimination of double taxation of corporate dividends, a more liberal depreciation rate and the retention of reserves in the business are other changes that are being demanded and may come to pass in 1946. Business experts consider the latest Act an interim bill and consider further changes will be made shortly.

Our Printing Troubles

WHEN the printing strike in Chicago plants last October was settled, after having delayed production of our magazine and forced us to combine the October and November issues, we were assured that future issues would be on schedule. However, that is not working out and we again must ask our readers and advertisers to try to understand that printing facilities and available manpower in Chicago printing plants are so overtaxed that a publisher, dependent as we are on contracting with an outside plant for our production, is unable to control or adhere to schedules.

Currently, our issues are being printed three to four weeks later each month than our established publication date. The plants got behind and have not been able yet to catch up. All possible measures are being taken to shorten this time, but it is apparent now that doing so will be a slow process. There is no question, of course, about being able to publish and mail our magazine every thirty days, and, in that respect, you will receive your issues regularly. The job is to get those thirty-day intervals back to normal publication dates.

We regret exceedingly the delay and inconvenience that these conditions may have caused and we are sure that they will clear up as time goes on. In the meantime, we thank you for your patience and trust that you will realize that the production troubles in no way affect the content of the magazine and will feel, therefore, that the service values of American Artisan are in no way lessened.

The Publisher.

Partnership or Corporation*

[Part 4—The Family Partnership]

A PARTNERSHIP which includes a wife or children as partners is an attractive business form for tax purposes. The income is divided between at least two persons, with the result that the surtax on the entire income is smaller. Also, each member of the family who receives the income would be entitled to a maximum standard deduction of $500 even though he had no actual deductions. While the husband would lose the surtax exemption for the wife or child if they received more than $500 in income, the surtax exemption would then be allowed to the wife or child. Finally, if the partnership is formed by gift, the estate of the taxpayer is reduced as a basis for calculating estate tax upon his death.

Precisely because family partnerships are so attractive, their genuineness is always subject to careful scrutiny. Both the Treasury and the courts realize that transactions between husband and wife are often undertaken purely for the purpose of minimizing taxes. On the other hand, both Treasury officials and judges know there is nothing legally or inherently improper about a family partnership. It is probably their effort to separate the genuine from the sham—often on the basis of atmosphere rather than coldly proven fact—that has been largely responsible for the apparent conflict in rulings and decisions on family partnerships.

Community Property Status

Taxpayers who live in community property states need not resort to husband-wife partnerships (as contrasted with a partnership involving children) as a means of dividing their income between husband and wife. In general, under the laws of those states and for income tax purposes, all income belongs equally to husband and wife. It is not taxed to the spouse who earns it, but is split equally between them. The result is to give residents of community property states a decided tax advantage not shared by married people of other states.

In most cases, taxpayers in a community property state gain by operating as an unincorporated business. As a corporation the income is taxable as one unit to the corporation, thus forfeiting the tax advantages of split income.

There are many small businesses which have been built up through the combined effort and capital of both the husband and wife. Usually there is no formal recognition of such a partnership because neither the husband nor wife realizes the tax advantage of a family partnership. The husband reports all of the income. A situation of this sort would probably be recognized as a valid partnership if the husband and wife went through the motion of forming a partnership. In one case the Tax Court recognized the existence of a partnership even though no formal agreement was entered into until a later year. If you have a business of this nature, it is advisable to consider the possibility of formalizing the partnership which already exists, in fact, between yourself and your wife.

Status of Family Partnerships

1. A family partnership will be recognized where the wife contributes her own services or capital.
2. If the wife's interest is obtained by gift, a family partnership will *not* be recognized in a *personal service* business whose income is attributable to the services of the husband, such as accounting, insurance, engineering, etc.
3. If the wife's interest is obtained by gift in a non-personal service business and she takes an active interest in the business, the family partnership will be upheld.
4. Not yet definitely settled is the status of a non-personal service partnership where the wife's interest is obtained by gift and the business is run as before the gift with the husband in full control.

The major question still undecided is whether a valid family partnership can be formed by means of gift in the case of a merchandising, manufacturing, etc., business requiring the investment of substantial capital, where control and operations continue substantially as before the formation of the "partnership." Different answers have been given at different times:

1. First, a long line of decisions held that if a legal partnership was formed by a gift of a business interest, then the partnership would be recognized for tax purposes. No attempt was made to examine into the company's operations except to see that the business was actually run as a partnership. The fact that there was no change in operation, that the purpose was primarily tax reduction, and that the husband continued in control, was not considered material.
2. Later, the Supreme Court ruled that where a taxpayer makes a gift in trust to a member of his family, and the "donor's" control over the property is in all essential respects the same as it was before the "gift," he continues to be charged with taxes on the income from the property. In considering whether full control is retained, the Court refused to "let mere formalism obscure the normal consequences of family solidarity;" or to permit "concepts of ownership to be fashioned out of legal niceties which may have little or no significance in household arrangements."
3. Strongly influenced by the Supreme Court's admonition to disregard mere form in a family arrangement, the Tax Court proceeded to disallow family partnerships formed primarily for tax purposes where the husband continued to exercise control of the business and to operate it as before, even though a legal, irrevocable gift was made. The Tax Court's reasoning

*Reprinted from a report of the same title prepared by Research Institute of America.

was that there was no bona fide gift, since the husband continued to control the property.

4. But no sooner had the Tax Court adopted this strict rule than it reversed itself (with many judges dissenting) and began again to follow the line of decisions handed down before the Supreme Court's decision. This change appeared to be based on a feeling that closing loopholes was for the legislature, not the courts.

Appeals have been taken from a number of the Tax Court decisions refusing to recognize "doubtful" family partnerships, and a final determination of the question now awaits the action of the Circuit Courts and the Supreme Court.

Emphasis on Ownership

The Circuit Courts have not ruled on the direct issue of a husband-wife partnership formed by gifts in a non-personal service business since the Supreme Court decision referred to above. The only recent Circuit Court decision dealing with family partnerships in a non-personal service business involved a gift in trust to minor children. The father became trustee with "all of the powers and privileges of an owner in reference to the trust estate." The family partnership was upheld regardless of the unlimited power of management given the father. He was held not taxable on the income on the ground that he could not derive any economic benefit from it since he had irrevocably divested himself of all interest in the property.

Although the usual husband-wife partnership was not involved, an interest given outright to a wife where the husband continues to control the business would appear to be somewhat analogous to this situation. The court's emphasis on the *ownership* of the interest as compared with the *control* of the property might *imply* a favorable decision on most husband and wife partnerships.

However, at best, this is only a preliminary indication of the trend on family partnerships. There will be no definite answer until the direct question of husband-wife partnerships is reviewed and a number of Circuit Courts have had a chance to pass on the issue.

Some Courts Disagree

The language of several other Circuit Courts in family partnership cases indicates the possibility of an unfavorable result. These courts have stressed the fact that for all practical purposes the husband surrendered little, since the wife had no voice in the business and the purpose was not to create and carry on a joint enterprise, or to unite in a new enterprise. In one case involving a personal service business, the court said: "One may not merely change the form but do business in substantially the same way. An essentially new and different economic unit must be formed. . . . When the cloak (of partnership) was removed, there stood the same individual, doing business in substantially the same way, and for all practical purposes, unimpeded or unhindered by any restriction which usually flows from a partnership relation."

These cases involve personal service businesses. The extent to which the reasoning will be applied to non-personal service business is still to be decided.

The Commissioner has recently acquiesced in several of the latest Tax Court decisions upholding the validity of family partnerships formed by means of gifts. It is too early to say this indicates that the Commissioner has thrown up the sponge in his fight against the family partnership. It probably means the Commissioner feels that the existence or non-existence of a bona fide partnership represents a question of fact on which the Tax Court is to be considered the final judge. Therefore, his willingness to go along with the Tax Court in a given case probably indicates merely that the Commissioner will not appeal the case and is closing the issue so far as that *particular* case is concerned. However, if the Circuit Courts agree with the Commissioner that family partnerships are fact questions to be decided by the Tax Court, then the Commissioner seems to be facing a losing battle. The most recent Tax Court holdings indicate that the court will recognize family partnerships formed by means of gifts even where the husband remains in control and operates the business unchanged.

Partnership by Gift

It is just about a toss-up as to whether a family partnership formed by gift will be recognized where the donor continues to control and run the business exactly as he did before. The best course is to delay any decision on the formation of a family partnership until the Circuit Courts have had a chance to pass on the question. Until then, you can be certain of a Treasury fight on this type of family partnership—a fight which you may well lose. And if the partnership is not recognized, the husband will be taxed just as if no family partnership had been formed. Thus, the penalties for an unsuccessful attempt to form a family partnership, recognizable for tax purposes, can be heavy. For instance:

1. If a corporation is dissolved to form a family partnership, the nonrecognition will prevent the recovery of any income tax paid by the stockholder on the dissolution of the corporation.

2. The gift tax paid on the gift made to the wife cannot be recovered merely because the family partnership is held invalid.

3. If the husband should die, the entire partnership assets may be included in his estate, even though a gift tax was paid.

In making a gift of an interest in a business, good will is an important factor to be considered. The substantial amount of good will attached to an old, successful business may increase the cost of making the gift beyond the point where it is profitable to form a family partnership.

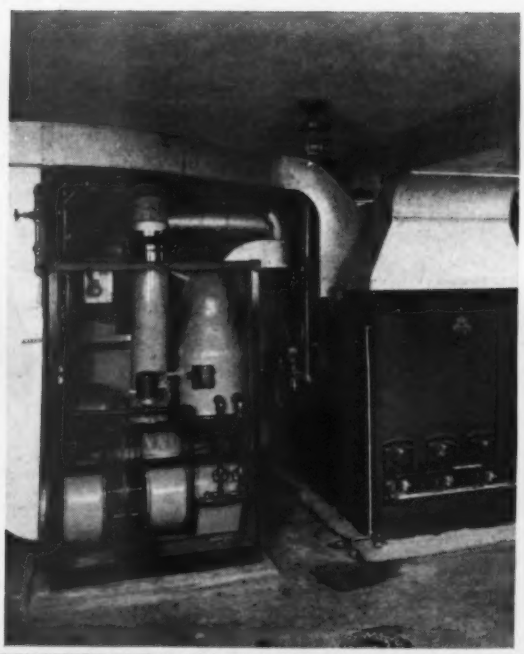
Minor children can be members of a partnership for tax purposes, state law permitting. Family partnerships formed with minor children have won more recognition than husband-wife partnerships. Because of the legal safeguards which surround a minor child and local court supervision of matters affecting minors, the courts have been inclined to feel that a real change in ownership takes place when a minor child is given an interest, either directly or indirectly, by means of a trust.

Despite this apparent recognition of minor child partnerships, final decision will probably depend on the way in which the husband-wife partnership question is answered. If husband-wife partnerships formed by gifts are not recognized on the ground that there is no real change in the business, the minor child partnership probably faces the same end.

The family partnership will probably be recognized where it follows dissolution of a corporation of which husband and wife have been joint owners. But note that the wife's interest must have been obtained from her own funds or by a gift from her husband at a

(*Continued on page 220*)

RESIDENTIAL AIR CONDITIONING



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Radiant Heating System In Which the "Panel" is Heated by a Blanket of Warm Air

By F. E. Giesecke

Consulting Engineer, New Braunfels, Texas

For years, the clinching proof of a "poor" warm air heating system has been the presence of a "hot" ceiling. In the article which follows, Professor F. E. Giesecke, one of the recognized authorities in air conditioning, suggests that instead of being detrimental a "hot ceiling" may, in fact, be a "panel" or radiant heating system of the utmost simplicity. Tests he has been conducting and described in this article add weight to his contention.

THE art and science of heating, cooling and ventilating buildings may be considered as originating about 2,000 years ago when the Romans built their still famous baths. In these structures the rooms to be heated were inclosed by floors and walls which contained ducts through which passed the heated gases from furnaces located below the rooms.

We can say, then, that these 2,000 year old heating plants were the world's first "panel" or radiant heating systems. In more modern times, "panel" heating had its origin in England when Professor A. H. Barker in 1907 was granted a patent on that system and sold his patent to R. Crittal & Co., Ltd.

The purpose of the following article is to describe a system in which warm-air heating is combined with radiant heating to secure the advantages of a "panel" heating system without the disadvantage of the "dead air" feeling which is experienced in a building serviced only with radiant heat.

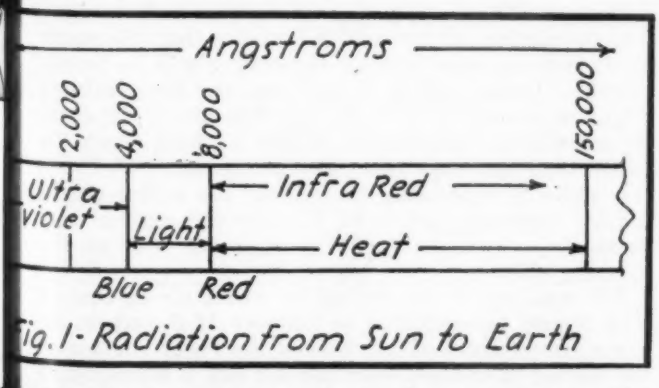


Fig. 1 - Radiation from Sun to Earth

Abbreviated Angstrom scale showing energy rays which produce heat and light.

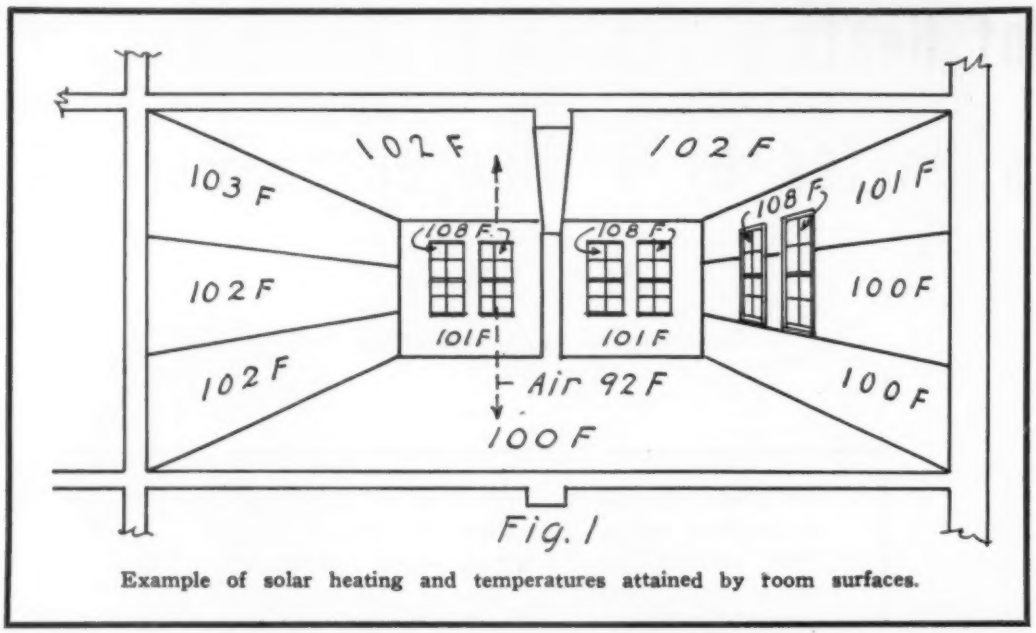
In the customary warm air heating system, the heated air generally enters the room through the warm air registers, flows through the room, where it is cooled, and then leaves the room through the return air faces, back to the furnace, where it is reheated. By this method the room is filled with warm air which heats the floor, the ceiling, the walls and the contents of the room. *Since the heating of the room is produced by means of the warm air, the mean temperature of the air in the room is always higher than the mean surface temperature of the floor, ceiling, and walls in contact with the air.*

When a room is heated by means of a radiant heating system, i.e., by means of a heated panel, the heat is radiated *from* the panel *to* the room exactly in the same manner in which heat is radiated from the sun to the earth.

The heating "panel" in such a system may be placed in the floor, in the ceiling, or in one of the walls of the room. There may be only one heating panel or there may be more than one panel for the room and the panel may be as large as, or smaller than, the floor, or the ceiling, or the wall in which it is placed. The panel may be heated by electricity, by steam, by water, by air or by solar radiation.

Explanation of Radiant Heat

It is customary to say that the panel *radiates* heat to the room. Strictly speaking, this statement is not correct; the sun does not radiate heat to the earth; the sun radiates *energy* of various wave lengths to the earth. That portion of the radiated energy which has a wave length of about 4,000 to 8,000 "angstroms" enables us to see and, for that reason, it is called light radiation. One "angstrom" is equal in length to one inch divided by about 250,000,000. Radiation having



Example of solar heating and temperatures attained by room surfaces.

a wave length of about 4,000 angstroms gives us the sensation of blue light; radiation having a length of about 8,000 angstroms gives us the sensation of red light; the portion of the radiation which has a wave length greater than 8,000 angstroms is called infra-red radiation, and the portion which has a wave length shorter than 4,000 angstroms is called ultra-violet radiation. Certain portions of ultra-violet radiation have the ability to destroy living tissue and living organisms and, for that reason, they are used to purify air and to treat diseases. The infra-red portion of the radiation cannot be sensed by the human eye and does not destroy living tissue, but when it is intercepted by a body, its energy is absorbed by the molecules of the body; it increases the motion of the molecules of the body and thereby the temperature of the body.

In other words, when infra-red radiation is intercepted by a body, its energy is transformed into heat and for that reason infra-red radiation is called heat radiation and it is customary to say that a heating panel radiates heat to its surroundings.

However, as a heating panel in the ceiling, for example, radiates heat to the floor and to the walls, the floor and walls become heated and then by contact with the air within the room the air also is heated so that the final result is similar to that obtained with a warm air heating system, with the difference, however, that with warm air heating the average temperature of the air within the room is higher than the average temperature of the surfaces of the inclosing walls, ceiling and floor, and with a panel or radiant heating system, the average temperature of the air is lower than the average temperature of the surfaces of the inclosing walls, floor and ceiling.

Example of Solar Radiation

The temperature of the air and of the surfaces of the inclosing walls, floor and ceiling which may exist in a panel or radiant heated room are shown in Fig. 1. This room is the west corner room on the second floor of a three-story class room building at the Agriculture and Mechanical College of Texas. The temperature readings were taken at 5 P. M., August 3, 1944. The building has a concrete frame, the walls are of hollow tile and brick, and a 6-inch concrete slab forms both floor and ceiling. The room was heated by solar radiation impinging on the southwest and the northwest walls of the building. The heat was transmitted from those walls to the interior of the room partly by radiation from the surfaces of the exterior walls, partly by conduction along the concrete frame and partly by convection currents in the air.

This illustration shows clearly that there was *no material difference* between the surface temperatures of the two exterior walls which were exposed to solar radiation and which formed the heating panels of the room and the surface temperatures of the interior wall, the floor, and the ceiling which received the heat from the exterior walls. The temperature of the surface of the interior wall was slightly higher than the temperature of the surface of the exterior walls, probably as a result of the radiation from the glass in the windows which was exposed to solar radiation and which had a temperature of 108 F. The temperature of the air within the room was slightly higher near the ceiling than near the floor and had a mean value of 92 F. The room shown in Fig. 1 had not been used for several days so the temperature within the room was due entirely to solar radiation.

Ceiling Heated by W. A. Blanket

When a room is heated by means of warm air entering the room near the ceiling as shown in Fig. 2, the warm air will float along the ceiling and gradually give up its heat to the room and settle toward the floor and return to the furnace through the return air face in or near the floor. As the warm air floats along the ceiling, it will give up a part of its heat to the ceiling —if the surface of the ceiling is cooler than the warm air in contact with it—and the ceiling will be heated thereby. Under certain conditions, the temperatures might be as indicated in Fig. 2. The air might enter the room at a temperature of 100 F., float along the ceiling and leave the room at a temperature of 75 F., and while flowing along the ceiling, the ceiling might acquire temperatures of 95 F. near the register and decreasing gradually to 90 F. near the wall on the opposite side.

The heating of the ceiling by warm air in contact with it may be explained as follows: If the warm air has a temperature of 110 F. and the lower surface of the ceiling in contact with the air has a temperature of 75 F., heat will flow *from* the warm air *to* the cool ceiling at the rate of 1.65 (110 — 75) or 58 Btuh. (Btu

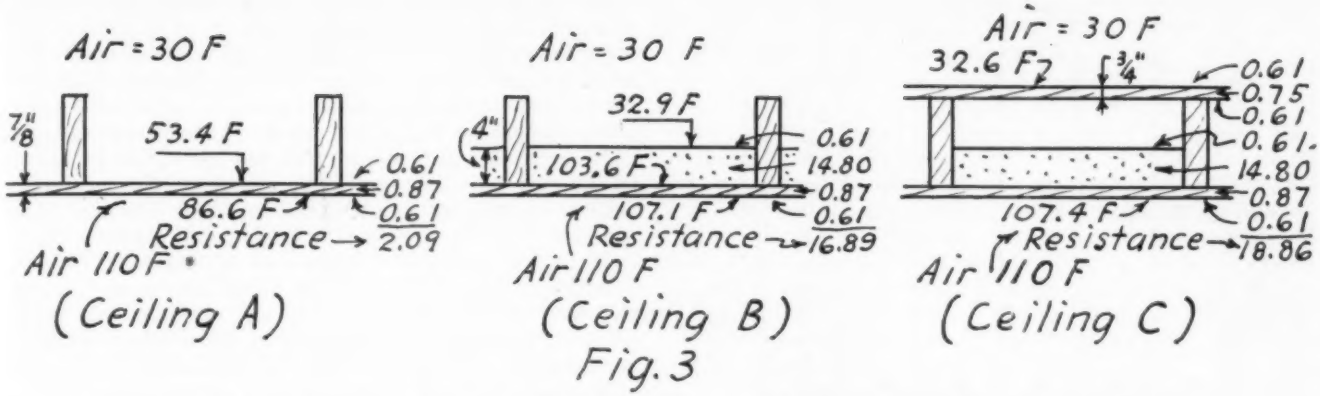


Fig. 3

Resistance of three common types of ceilings and ceiling surface temperatures with and without insulation. Text explains resulting conductances and heat flow in Btu per hour.

per hour) per sq. ft. if the air-film coefficient is 1.65. However, this rate of heat flow from the air into the ceiling will continue only so long as the temperature of the lower surface of the ceiling remains 75 F. If the heat which enters the ceiling from the air in contact with it cannot escape freely from the surface of the ceiling, either by conductivity through the ceiling into the space above or by radiation into the space below or both, the temperature of the ceiling surface will rise until a condition of equilibrium has been attained and the rate of heat flow from the air to the ceiling will decrease correspondingly. For example, if the temperature of the surface of the ceiling rises from 75 F. to 95 F., the rate of heat flow into the ceiling from the air in contact with it will be reduced from 58 Btuh. to 1.65 (95 — 75) or 33 Btuh. per sq. ft. If the temperature of the ceiling should rise to 110 F., there would be no flow of heat from the warm air into the ceiling.

During a test conducted by the writer at the University of Illinois during May, 1943, to determine the difference between the temperature of the lower surface of the ceiling and that of the air 3 in. below the ceiling, it was found that during 50 observations the air temperature varied from 97 F. to 111 F. and the corresponding ceiling temperature varied from 91 F. to 101 F. so that the difference between the two varied from 6 to 10 degrees. This large difference indicates a high rate of heat flow through the ceiling of the test booth in which the observations were made.

The writer found a case in a spinning mill in which the temperature of the lower surface of the ceiling and the temperature of the air in contact with the ceiling were both 94 F.; in that case, there was no flow of heat from the air into the ceiling because the temperature of the space above the ceiling was so high and the ceiling was so well insulated that it was practically impervious to the flow of heat under those conditions.

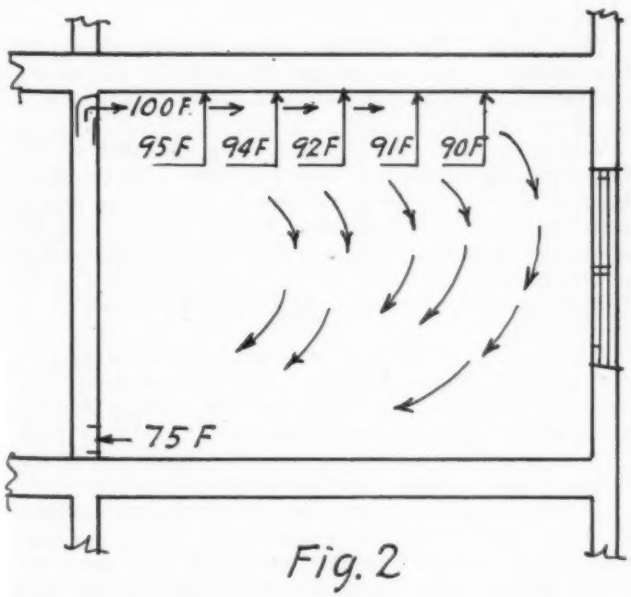


Fig. 2

Warm air stream entering near ceiling and wiping ceiling gives approximately these temperatures of the ceiling surface.

Calculation of Ceiling Temperature

The *temperature of the ceiling* of a room heated by means of warm air as shown on Fig. 2 can be calculated quite accurately as illustrated for the three types of ceiling construction shown in Fig. 3.

If the ceiling (ceiling A, Fig. 3) consists simply of a 7/8-in. layer of yellow pine having a resistance of 0.87 and if the two air film resistances are each 0.61, the total resistance of the ceiling to the flow of heat through it is 2.09 deg. F. for the flow of heat at the rate of one Btuh. per sq. ft. The conductivity of the ceiling, i.e., the over-all U-value of the ceiling, is then 1/2.09 or 0.48 Btuh. per sq. ft. per degree temperature difference. If the temperature difference—air below ceiling to air above ceiling—is 110 — 30 or 80 deg., heat will flow through the ceiling at the rate of 0.48 × 80 or 38.4 Btuh. per sq. ft.

Since the air-film resistance to the flow of heat is 0.61 deg. per Btuh., the temperature drop through the air film is 0.61 × 38.4 or 23.4 deg. and the temperature of the lower surface of the ceiling is 110 — 23.4 or 86.6 F.

Similarly, the temperature of the upper surface of the ceiling is 30 + 23.4 or 53.4 F.

As a check on the calculations, the temperature drop through the 7/8-in. yellow pine ceiling is 0.87 × 38.4 or 33.4; this should be, and is, practically equal to 86.6 — 53.4 or 33.2; this shows that the calculated temperatures are correct.

If a 4-in. mineral wool insulation having a resistance of 14.80 is added to the ceiling as shown in Fig. 3 (Ceiling B), the total resistance to the ceiling is increased from 2.09 to 16.89; the rate of flow of heat through the ceiling is decreased from 38.4 to 4.75 Btuh. per sq. ft.; the temperature drop through the air film is reduced in proportion, i.e., from 23.4 to 23.4 × 4.75/38.4 or 2.9, and the temperature of the

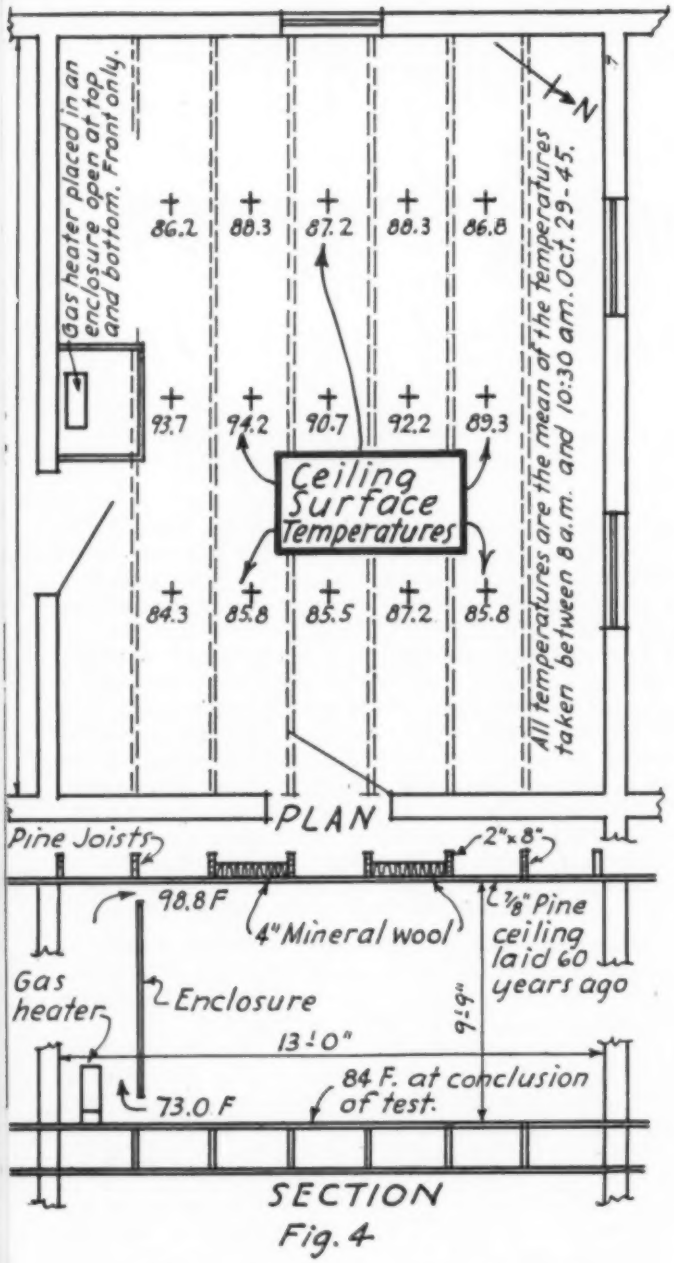


Fig. 4

Results from a test setup using a blanket of warm air to heat the ceiling. Note how joist spaces with insulation show slightly higher ceiling surface temperatures.

lower surface of the ceiling increased from 86.6 F. to 107.1 F. Similarly, the temperature of the upper surface of the mineral wool is 30 + 2.9 or 32.9 F., and the temperature of the lower surface of the mineral wool is (4.75 × 14.8 deg.) + 32.9 or 103.4 F., and the temperature of the upper surface of the ⅞-in. pine sheathing is 107.1 — (4.75 × 0.87) or 103.8. These two surface temperatures are the same; both calculations were made simply to check the arithmetical work. The difference between 103.4 and 103.8 is the result of inaccurate reading of the slide rule.

If a ¾-in. wood sheathing, with a resistance of 0.75, is added to the ceiling construction as shown in Fig. 3 (Ceiling C), the resistance of the ceiling is increased from 16.89 to 18.86 and the flow of heat through the ceiling is decreased from 4.75 to 4.25 Btuh. per sq. ft. per deg.; the temperature of the lower surface of the ceiling is increased from 107.1 to 110 — (4.25 × 0.61) or 107.4 F.

If the temperature of the air in contact with the lower surface of the ceiling is lowered from 110 F. to 90 F. and if the temperature of the air above the ceiling is raised from 30 F. to 50 F., the temperature difference—air to air—will be reduced from 80 deg. to 40 deg. and the rate of heat flow through the ceiling as well as the temperature drop through the air film in contact with the ceiling will be only one-half of what they are when the temperature difference is 80 deg. For the three cases shown in Fig. 3, the temperature drop through the air film will then be 11.7, 1.5 and 1.3 degrees and the ceiling surface temperature will be 78.3 F., 88.5 F., and 88.7 F., respectively.

Strictly speaking, this reasoning is not correct because the thermal conductivity of a material varies somewhat with the temperature of the material; however, in calculations relating to the heating and cooling of buildings, the variation in the temperature of the materials is comparatively small and the data on which heat flow calculations are based are generally somewhat indefinite, so it is sufficiently accurate to assume that the thermal conductivities and the thermal resistances remain constant for the range of temperatures experienced in those calculations.

Actual Ceiling Surface Temperatures

In order to secure experimental data relating to the type of warm-air radiant heating discussed in this article, the writer equipped the experimental room shown in Fig. 4. The room was heated by means of a gas space heater which was placed in a vertical enclosure so that the heated air was discharged into the room along the ceiling through an opening 6 by 36 in. and the cooled air entered the enclosure along the floor through an opening 12 by 36 in. A vertical plate of sheet rock was placed in front of the gas heater so that the radiation from the heater was intercepted and kept from heating the floor of the room.

The test room is on the second floor of a two-story residence; the room below was not heated so that all heating of the floor of the test room had to come by radiation from the ceiling of the test room. The space above the test room is a low attic room with open ventilators.

The construction of the ceiling was as shown in Fig. 3 (a) except in two of the bays in which the construction was changed to that shown in Fig. 3 (b) as shown in Fig. 4.

The data shown in Fig. 4 are the *averages* of the readings taken during a 3-hour period. The temperature of the air in the attic was not measured and it was not known *how* and *where* the temperature of the air in the room changed from 98.8 F., the temperature at which the air entered the room, to 73.0 F., the temperature at which the air returned to the duct to be reheated.

However, it is evident from the 15 ceiling *surface temperatures* shown in Fig. 4 that the warm air distributed itself quite evenly over the entire ceiling, since the *ceiling surface temperature* varied only from 93.7 F. at the point where the warm air entered the room to 85.8 F. at a point about 10 feet away.

It is also evident from the observed temperatures that the ceiling surface temperatures under the bays which were insulated with mineral wool were comparatively higher than those under the bays which were not so insulated. For example, the average of the six temperatures under the two insulated bays was 89.3

F. and the average of the three temperatures of the uninsulated bay located between the two insulated bays was 87.8 F. This difference is less than expected from the calculations shown in Fig. 3; the reason is that conditions had not become constant when the temperature readings were taken, and heat was still being absorbed by the 4-in. layer of insulation.

It is evident also that the entire ceiling formed a heating panel for the room since its mean temperature was materially higher than the mean temperature of the air within the room, and since, during the heating process, the temperature of the surface of the floor rose to 84 F. or ten degrees above the temperature of the air in contact with it, due, no doubt, to the radiation from the ceiling.

It is also evident that if the warm air in the room were withdrawn near the ceiling as shown in Fig. 5, the distribution of the warm air along the ceiling would have been more nearly uniform than that shown in Fig. 4, and also that if the room were provided with two air supply registers and two return air faces on opposite walls, and especially if the registers were diffusing registers, the distribution of warm air would have been very uniform and, in fact, it seems quite probable that in this manner the ceiling could be maintained at a uniform temperature throughout its extent so that it would become a very effective heating panel for the room and the system would be a warm-air radiant heating system.

Design of a System

To design a warm-air radiant heating system of the type just described, the following steps should be taken:

Step 1—Calculate the heat loss of the room.
Step 2—Calculate the mean surface temperature, MST, of the floor and the walls.
Step 3—Determine the mean ceiling surface temperature necessary to emit the required quantity of heat.
Step 4—Determine the mean air temperature necessary to produce the required ceiling surface temperature.
Step 5—Select the temperature drop in the air flowing through the room and calculate the rate at which the air must flow through the room.
Step 6—Design the duct system.
Step 7—Design the furnace and its auxiliaries.

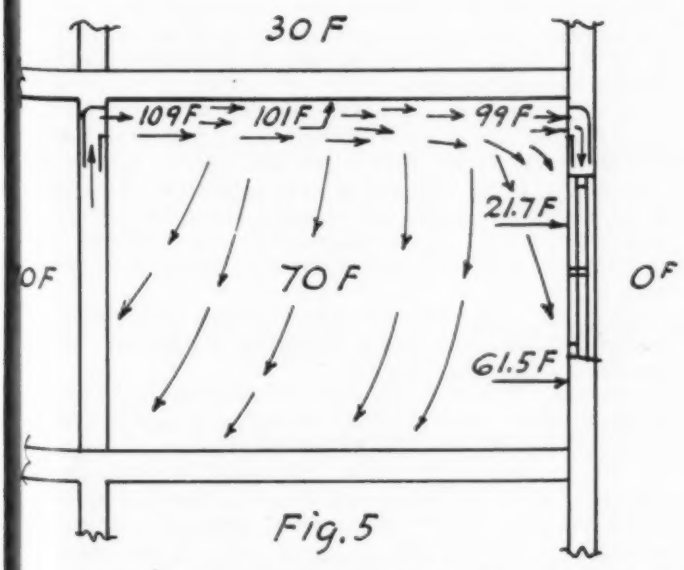


Fig. 5

A warm air blanket panel system probably will have both supplies and returns at ceilingto keep blanket at a high

The following design of a warm-air radiant heating system for the room shown in Fig. 4 illustrates the method outlined above.

Step 1—The room is a west-corner room on the upper floor of a two-story residence. Its dimensions are 13x18x9.75. The windows are 3 ft. wide and 6 ft. high. The indoor air temperature is to be 70 F. when outdoor air temperature is zero F. and the attic temperature is 30 F. The U-values of the exterior wall, the window glass, and the ceiling are 0.20, 1.13, and 0.06, respectively.

It is assumed that the entire residence is heated and that the room will lose no heat through the floor or through the interior walls.

	Btuh.
The heat loss through the exterior walls is (13 × 18) 9.75 × (70-0) 0.20 × 1.15.....	4,900
The heat loss through the three windows is 3 (3 × 6) (1.13-0.20) (70-0) 1.15.....	4,200
The heat loss through the ceiling is 13 × 18 × 0.06 × (110-30)	1,000
The heat loss for ventilation, assuming one complete air change per hour, is 13 × 18 × 9.75 × .018 (70-0)	2,900
	13,000

In the above calculation, an addition of 15 per cent was made for northwest and southwest exposures and the U-value of the wall was deducted from the U-value of the glass instead of deducting the window area from the wall area because that simplifies the calculations; the calculated heat losses are expressed in units of 100 Btuh. because that simplifies the calculation and is sufficiently accurate.

To calculate the heat loss through the ceiling, it was assumed that the air in contact with the ceiling would have a temperature of *about* 110 F.

Step 2—The temperatures of the interior surfaces of the floor and of the interior walls may be assumed to be 70 F. because it is assumed that the entire building will be heated. To find the temperature of the interior surfaces of the exterior walls it is known that heat will flow through the wall at the rate of 0.20 × 70 or 14 Btuh. per sq. ft.; also, that the resistance to the flow of heat through the air film in contact with the interior surface of the wall is 0.61 deg. F. per Btuh. per sq. ft.; the temperature drop through this air film must then be 0.61 × 14 or 8.5 deg. and the temperature of the surface of the wall, 70 — 8.5 or 61.5 F.

Similarly the flow of heat through the glass is at the rate of 1.13 × 70 or 79.10 Btuh. per sq. ft.; the temperature drop through the air film is 0.61 × 79.1 or 48.3 deg., and the temperature of the inner surface of the glass is 70 — 48.3 or 21.7 F. The MST of the floor and the walls is found by multiplying the individual areas by their respective temperatures and dividing the sum of the resulting products by the sum of the areas, thus:

Surface	Area	Temp.	Product
Floor	234	70.0	16,380
Interior walls	302	70.0	21,140
Exterior walls	248	61.5	15,250
Windows	54	21.7	1,170
	838		53,950

(*Continued on page 222*)

How Much?

The $64 Question in Blower Sales

AT THE TIME war put an end to "normal" procedure in the warm air heating business, it was said by some authorities that "the next big selling effort will be to replace every one of the eight million gravity furnaces with a modern winter air conditioning system."

Those who forecast this effort declared that the advantages of the complete new heating unit were so outstanding as compared with the addition of "accessories" that few home owners would give serious consideration to the "step-by-step" method.

What would have happened had there been no war cannot be decided; it does appear now, however, that there are on order and sold to customers a very surprising number of "accessories" which will modernize existing gravity furnaces. Particularly is this true of furnace blowers—"packaged blowers"—and also true of conversion oil burners, stokers, gas burners—all "accessories" in the liberal interpretation.

Who's Buying Blowers—and Why?

It should be of interest, therefore, to see what proponents of (1) completely new units and (2) accessories for conversion actually have to offer the prospective purchaser in the way of costs. Why costs? Because when all is said and done, it will be costs, probably, more than anything else, which will make the decision for the buyer.

Therefore, from several representative installers the facts presented in this article were compiled. Specifically, these installers were asked:

(a) What changes do you make in an old installation when you add a blower?

(b) How do you price such a conversion job?

(c) Do you find it profitable?

Why is there more interest in conversion jobs on the part of the buying public than had been anticipated?

The answer seems to be that the average home owner is thrifty. Being thrifty, he often hesitates to tear out and throw away a good, usable gravity furnace when he learns that he can enjoy some of the acknowledged benefits of winter air conditioning by merely adding a blower to his present plant. This doesn't necessarily imply any less interest in more complete winter air conditioning on the part of the home owning public; it simply means that those who feel they can afford a complete new system will buy it without much argument or persuasion on the part of the dealer.

It also means that, among those who perhaps think they can't afford to go all the way just now, many will respond quickly and favorably to the heating contractor's proposal to give them the assurance of quicker heat, improved heating efficiency and uniform temperature throughout the house by installing a blower package unit to provide positive, controlled circulation of clean, filtered air.

Some of these property owners, taking one step at a time, will first decide to add a blower package unit and from that first step will add automatic firing, automatic humidification, better control systems.

But whether the sale ends with the simple addition of a blower unit or extends on to the installation of a complete new plant, it *starts* with the sale of the blower. And this brings us to the several questions which have been asked readers about the mechanical features of these conversion jobs, the prices charged and the profits.

What Are Dealers Offering?

For convenience in analyzing and indicating the relative values of the various steps taken by these heating contractors when they install blower package units, the accompanying Table No. 1 classifies them according to:

(a) What is done,

(b) Who does it, and

(c) Why it is done.

The data given in Table No. 1 do not necessarily indicate prevailing practice throughout the industry because the number of heating contractors interviewed was neither very large nor widely distributed, but each of those interviewed has been quite active in making forced air installations during pre-war periods ranging from three or four years up to fourteen or fifteen years. All are located in the midwestern section of the country.

Those interviewed have been roughly separated into three groups on the basis of their respective practices in making conversion blower installations, as follows:

Group 1. Those who aim at near-perfection and two of whom (both successful, money-making installers) said flatly, "If I can't do the job the way I believe it ought to be done, I'd rather let a competitor worry with it."

Group 2. Those who are less exacting in their requirements and who don't insist on everything demanded by Group 1 installers.

Group 3. Those who believe it better to make the simplest possible installation. An extreme case in this group is the installer who makes no pretense of cleaning the furnace or the pipes. He merely removes the gravity return air shoes and attaches the blower to whichever one of the openings is most convenient; dovetails a metal patch to cover each of the other openings and strips the dovetailed joint with asbestos paper; attaches one return air duct to the blower

TABLE No. 1

Item No.	WHAT	WHO*			WHY		
		Practice of Group No.			For better heating results	For improved appearance of the plant	For the customer's convenience
		1	2	3			
	ITEMS AFFECTING FURNACE						
F-1	Compare known or estimated heating capacity of furnace with calculated or carefully estimated heat requirement of house.	A	S	N	√		
F-2	Change location of furnace.	S	S	N		√	√
F-3	Clean combustion chamber, radiator and smoke pipe.	A	U	S	√		
F-4	Clean air circulating space inside the casing.	A	A	U	√		
F-5	Install baffle plate at bottom of hood when individual leaders are used instead of a single supply trunk duct.	A	U	N	√		
F-6	Reset and/or make minor repairs to furnace if needed.	U	S	N	√		
F-7	Install new casing hood.	U	S	N		√	
F-8	Install new lower section of casing.	A	S	N		√	
F-9	Strip casing joints with asbestos tape.	A	S	N		√	
	ITEMS AFFECTING SUPPLY DUCT SYSTEM						
S-1	Replace old leaders with new trunk line duct system.	S	S	N	√	√	√
S-2	Replace old leaders with new, smaller sizes.	A	U	S		√	√
S-3	Use old leaders.	N	S	U			
S-3-a	When old leaders are used, use them without cleaning.	—	N	S			
S-3-b	When old leaders are used, vacuum clean them.	—	U	U			
S-3-c	When old leaders are used, take down and wash out.	—	S	N			
S-3-d	When old leaders are used, repaper or repaint.	—	U	S		√	
S-3-e	When old leaders are used, calculate required sizes to see if present sizes are fully adequate.	—	S	N	√		
S-4	Install additional warm air supply registers with new leaders from furnace (or branches from new trunk) to provide better warm air distribution in rooms.	S	S	N	√		
S-5	Vacuum clean or swab wall stacks.	A	U	U	√		
S-6	Remove, wash and replace old warm air registers.	A	S	N	√	√	
S-7	Install lock-type dampers in all leaders or branches.	A	U	S	√		
	ITEMS AFFECTING RETURN AIR DUCT SYSTEM						
R-1	Check C.F.M. (or B.t.u.) requirements of rooms or groups of rooms to see if present return air faces are well located. Install new return air faces and ducts if and when needed to insure better circulation.	U	S	N	√		
R-2	Replace old return air pipes in basement with new, smaller sizes.	A	U	S		√	√
R-3	Install lock-type dampers in all return air ducts.	A	S	N	√		
	ITEMS AFFECTING CONTROL OF PLANT						
C-1	Install fan switch in bonnet.	A	A	A	√		
C-2	Install summer fan switch on first or second floor.	S	S	N			√
C-3	For hand-fired furnace, install room thermostat and damper motor with limit control in bonnet.	U	S	N	√		√

*(A)=Always; (S)=Seldom; (U)=Usually; (N)=Never.

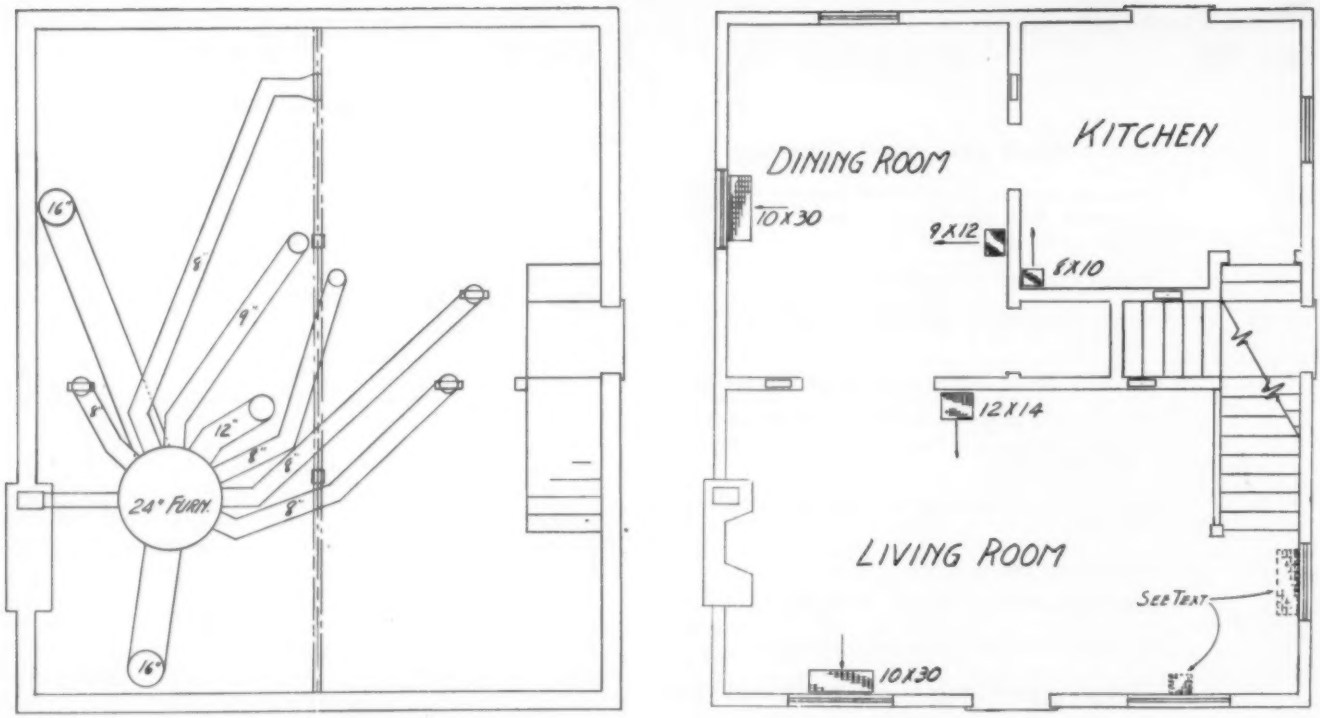


Fig. 1 (Basement)—This is the gravity furnace which is modernized in this article. Right is the first floor plan showing floor registers and returns and in the living room the new cold air and new floor register one dealer insists are necessary for satisfactory heating. Upstairs are three bedrooms and bath—no returns from second floor.

cabinet and butts the other return ducts into the side of the first one. He expressed his philosophy of all furnace work like this: "Get the job. Get it installed. Get the money. Get out."

The key letters A, U, S and N in the "Who-column" of Table No. 1 indicate the practices of *most*, but not necessarily *all* of the members of a given group.

A indicates that *most* of the members of the group ALWAYS do the work indicated.

U indicates that *most* of the members of the group USUALLY do the work indicated.

S indicates that *most* of the members of the group SELDOM do the work indicated.

N indicates that *most* of the members of the group NEVER do the work indicated.

The reason why each item of work is done is indicated in the three "Why-columns."

How One Dealer Figures Price

In response to the request for specific price information, one heating contractor in Group 1 offered complete selling price data on a typical conversion job.

To illustrate just what this contractor insists on doing, the plan of the gravity job shown in Fig. 1 was submitted. The simplest form of conversion blower installation which he would make is shown in Fig. 2 and his price breakdown is itemized in the "Selling Price" column of Table No. 2.

For the reader's convenience, the corresponding net wholesale prices of the items are given in the "Approximate Net Cost" column of Table No. 2. If it is assumed that the cost of direct labor is $30.00 and that overhead expense is 100 per cent of direct labor, then we have Table No. 3.

It should be remembered that the dealer submitting this conversion job price is in Group 1, the group which goes much farther than the average in aiming at near-perfection in conversion blower installations. He does not actively solicit blower package sales for existing gravity furnaces and whenever he is asked to

TABLE No. 2 *(See Fig. 2)*

	ITEM	Selling Price. (Includes material and labor.)	Dealer's approximate net cost. (Material only.)
1	12-inch blower package unit	$120.00	$ 59.00
1	new 7-inch round supply duct to living room	12.00	6.08
5	7-inch supply branches from trunk to first floor registers and second floor risers	90.00	35.35
1	20-in. x 8-in. supply trunk (extended plenum type), 8 ft. long	(See text)	8.00
2	7-inch supply ducts	20.00	10.10
1	10-inch return duct from dining room and kitchen	10.00	8.29
1	panned joist space from kitchen	2.50	1.50
1	16-inch return from living room	16.00	10.50
1	casing bonnet	7.50	4.15
1	casing baffle plate	5.00	3.00
1	warm air plenum, 24-in. x 24-in., 12-inches high	7.50	2.30
1	return air plenum, 24-in. x 24-in., 24-inches high	7.50	4.60
1	damper regulator set with bonnet limit control	35.00	21.75
1	new lower casing section	5.00	3.00
	Totals	$338.00	$177.62

TABLE No. 3

Cost of material	$177.62
Cost of labor	30.00
Overhead	30.00
Total cost	$237.62
Selling price	338.00
Margin	$100.38

figure on such a job, he insists on pricing the job on the following basis:

In explanation of these costs (Table No. 2) the contractor describes his procedure thus:

1. Remove all old basement warm air leaders and replace with new supply ducts; either individual leaders from bonnet to register (or stack), or a rectangular trunk of the simple, extended plenum type, with round branches, or a combination of the two. The new supply duct system is priced as follows:

(a) Seven-inch leader from bonnet to first floor register or to second floor stack. If the old register is used, the installed price is $10.00 for a run not more than 10 feet long. If a new register is used, the installed price of the run is $12.00.

(b) Rectangular trunk 8 inches deep with 7-inch round branches. For a trunk not larger than 30 x 8 inches and not more than 10 feet long, and with branches not more than 10 feet long, the installed price is $18.00 per opening.

2. Remove all basement return air ducts and replace with new, smaller sizes. See prices in next paragraph.

3. Install return air face or register in each first floor room except bath or lavatory. Use a register instead of a face in kitchen so the valves can be closed to help guard against spread of cooking odors throughout the house. The pricing basis (subject to reasonable modification by the estimator) is as follows:

(a) For round pipes from face (or from panned joist space) to return air plenum, usually not more than 10 feet long, $1.00 per inch of pipe diameter. (Thus, a 10-inch run, $10.00; a 16-inch run, $16.00, etc.)

(b) For rectangular return air trunk with 7-inch round branches, $12.00 for each such branch.

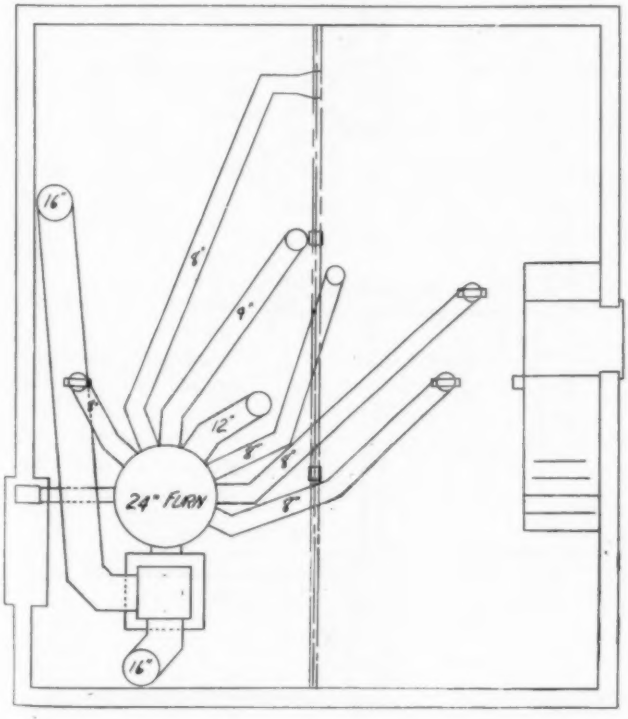


Fig. 3—This is the conversion as the "take-a-chance" dealer would revamp it. Text explains what this dealer doesn't do, but gets good money for doing.

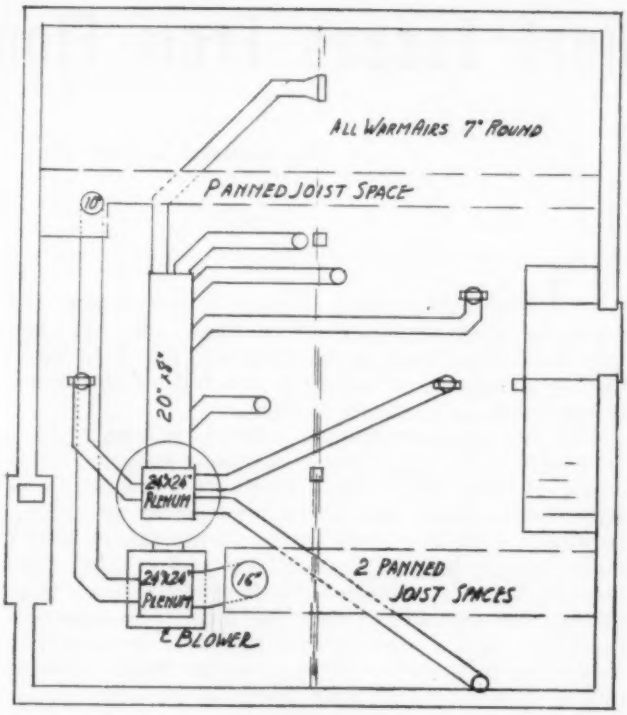


Fig. 2—This is the conversion job the conscientious dealer insists on doing. The drawing does not show, but the text explains, the many changes this dealer insists on.

When panned joist spaces connect directly into the top of trunk without the use of round pipe connection, $8.00 for each such panned joist branch.

(c) For returns from second floor rooms, charge as above plus extra charge for return risers, depending on labor and material required.

3. Install lock dampers in all leaders and branches, both supply and return. Prices are included in the above prices of complete runs. If other lock dampers are needed, installed price is $1.00 each for 7-inch and smaller; $1.50 for 8-inch to 12-inch, inclusive; $2.00 for 14-inch to 20-inch.

4. New casing bonnet up to 48-inch diameter, $7.50; larger than 48-inch, $10.00.

5. Casing baffle plate at line of top casing ring, $5.00.

6. New lower casing section for casing up to 48-inch diameter, $5.00; for casings larger than 48-inch, $7.00.

7. Return air plenum and (if needed) warm air plenum, not larger than 24 inches square and 24 inches high, $7.50; same not more than 24 inches square and 42 inches high, $12.00.

8. Damper regulator set with bonnet limit control, $35.00. (Hand fired coal.)

The heating contractor whose conversion layout is shown in Fig. 2 likes to relocate return air faces to try to eliminate drafts of air across the floor. For this job his "minimum requirement" would be placing a return air face near the foot of the stairway and locating a warm air register in the same half of the living room where the stairway descends. To avoid patching a hardwood floor he would, with the owner's approval, leave the original return air face and install a new one in the position shown by the dotted lines in Fig. 1. He would reduce the size of the leader supply-

(*Continued on page 216*)

Heat Losses From Floors Laid on the Ground*

By Richard S. Dill; Wm. C. Robinson; H. C. Robinson

INSOFAR as heat transfer is concerned, the desirable characteristics of a floor are (1) low heat loss, considered as an economic factor in heating the house, and (2) warmth or a feeling of warmth to the touch, as it affects comfort.

The two characterics are related, inasmuch as a floor with a high heat loss is normally expected to be colder on the surface than a floor with a low heat loss. However, comfort does not depend solely upon temperature; with the same surface temperature, materials of high thermal conductivity and of high heat capacity per unit volume feel colder to the touch than others. For example, a concrete floor feels colder to the touch than a woed floor at the same temperature. Insulation in the form of rugs on the floors tends to nullify this difference with floors at the same measured temperature.

Floors can be classified on the basis of arrangement as follows: Those laid over heated basement or over other heated spaces, those laid over unheated spaces, and those laid on the ground.

Basements Keep Floors Warm

In most houses having heating devices in the basement, the heat loss through the floor is practically negligible because the basement is warmed by radiation and convection from the heating device and from the pipes and ducts. Very often the same condition is true of floors laid over closed crawl spaces containing heating pipes and ducts. In many cases there is an actual gain of heat in the house from the basement through the floor. This accidental effect probably accounts for the satisfactory performance of some heating systems that would not otherwise provide uniform heat in houses. In view of these facts, further consideration will not be given in this paper to floors laid over heated spaces.

The temperature at a given point or given region of a floor obviously depends upon the rate at which heat is gained or lost at that point or region. If the walls

Reprinted from Report BMS 103 "Measurement of Heat Losses from Slab Floors," National Bureau of Standards, U. S. Dept. of Commerce.

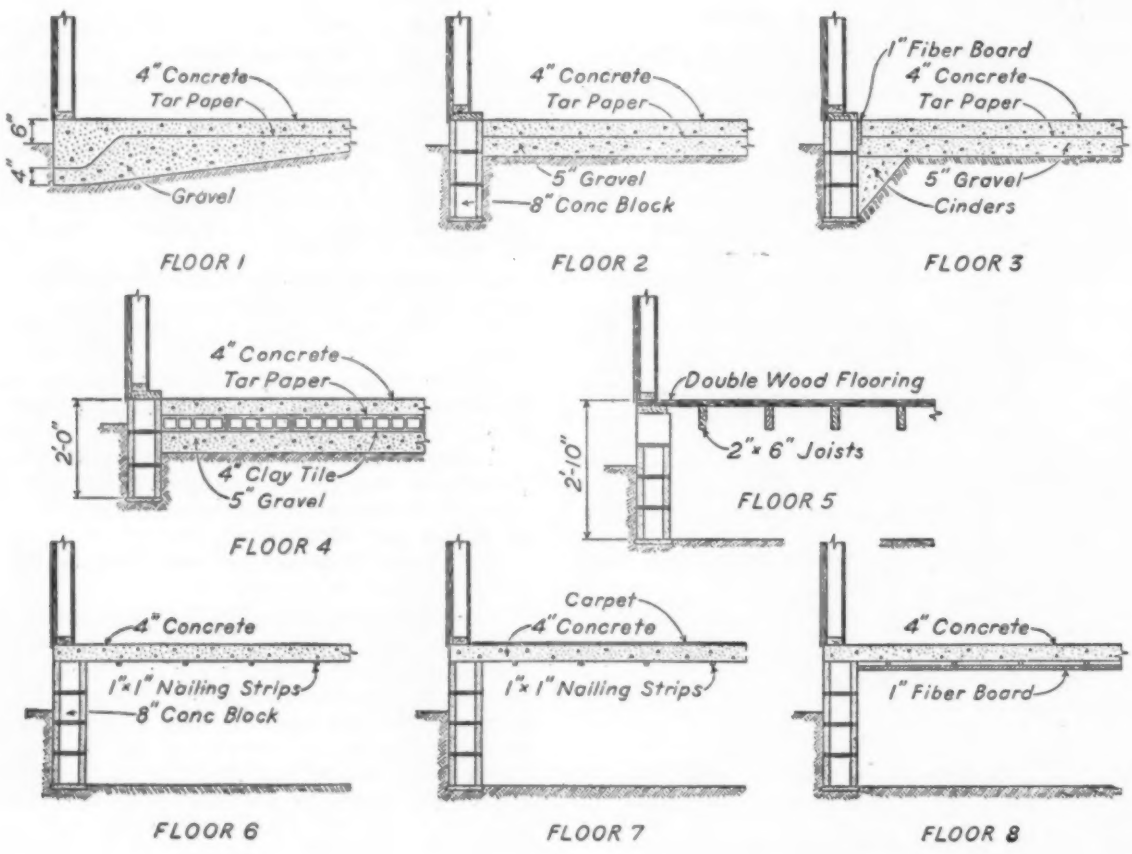


Fig. 1—Cross sections of eight floors tested—four slabs laid on ground; four floors over crawl spaces

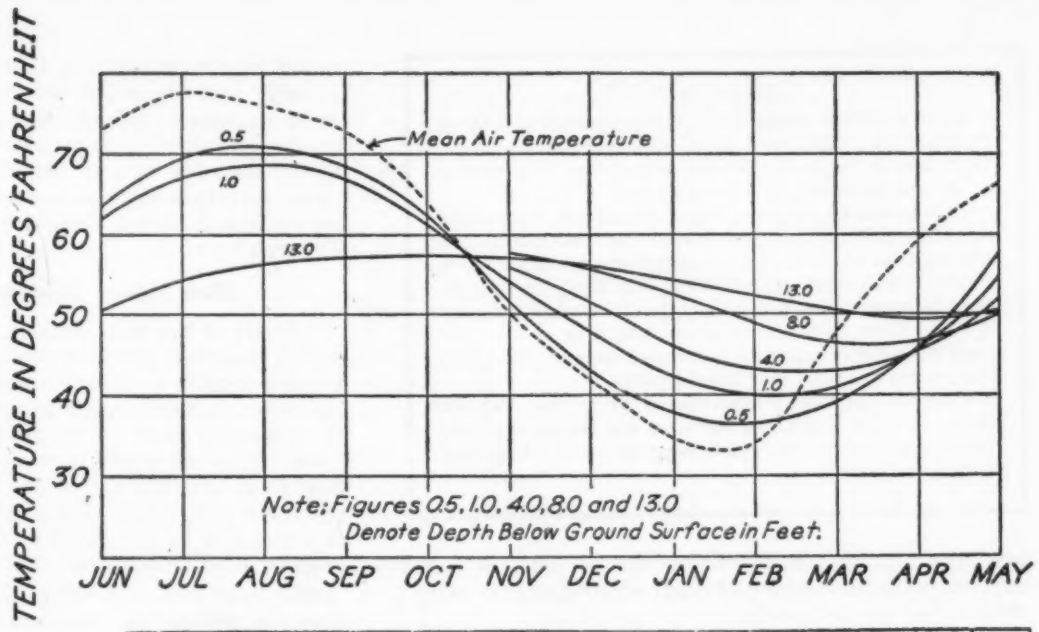


Fig. 3

Ground temperatures at depths up to 13 feet are here plotted against the months of the year. Note that at depths a floor slab ordinarily will occupy the ground temperature follows air temperature pretty closely.

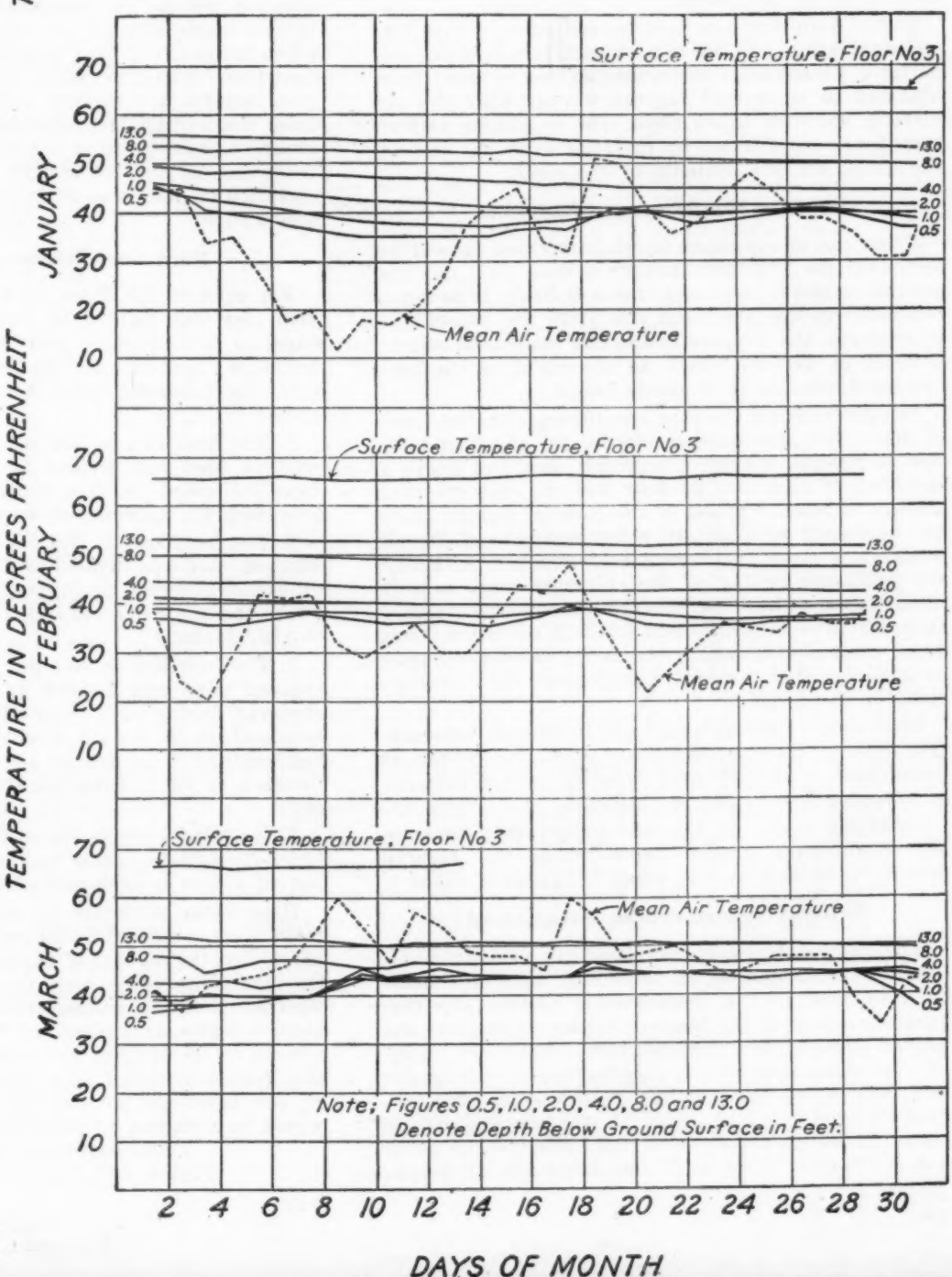


Fig. 4

These three sets of curves show ground temperatures underneath Floor No. 3 (see Fig. 1) for January, February, March from surface to 13 feet underground. The interesting feature is the uniformity of the ground temperature regardless of outside air temperature fluctuations.

ABSTRACT

Four concrete floors laid on the ground and three concrete and one wood floor laid over crawl spaces were tested for heat-transfer properties in a special structure provided for the purpose.

It was found that the heat loss of the floors laid on the ground was decreased by insulating the edges; that the heat loss through the center of such floors is relatively small when the enclosing structure is continuously heated; that the edge loss for a wood floor laid over a crawl space is small; and that the edge loss for an insulated concrete floor laid over a crawl space was considerable.

Observed ground temperatures at various depths, down to 13 ft below the surface, are reported in the paper and some factors are suggested for estimating floor heat losses.

are poorly insulated, the floors will be cold near the exposed walls because a cold draft of air descends along the surface of such walls.

Floors gain and lose heat by radiation, convection, and conduction, and the radiant gain is sometimes important. Floors laid over unheated spaces have been observed to be several degrees warmer than the air directly above or below them. The conclusion is that such floors are warmed by radiation from the ceiling, the walls, and the contents of the room.

Surface Temperature Important

From the observations herein described, it will be seen that the heat loss through a floor laid on the ground or laid over a crawl space is likely to be small compared to the total heat loss from the house. For this reason, the temperature of the floor as it affects comfort is, in most cases, as important as the heat loss considered as an economic factor.

For determining the heat loss through several types of floors, the general plan adopted for the floor tests was to provide a heavily insulated structure above a specimen of each kind of floor and to observe the amount of heat, supplied in the form of electric energy, necessary to maintain a temperature of 70° F within the structure during cold weather. Although the walls and ceiling of the structure were heavily insulated, some heat loss through them was inevitable. In order to correct the data for this condition, tests were made during which the floors themselves were so insulated that the heat loss through the structure could be measured.

Objectives of the project were to furnish comparative data on floors of different types, and, as far as practicable, to furnish data whereby the performance of proposed floors could be predicted.

(Editor's Note: In the test procedure data were also obtained on ground temperatures at varying depths—data we have long wanted. This data follows).

Ground Temperatures Determined

The temperatures underground at various levels beneath the surface, down to 13 feet, were also measured by means of a thermocouple system. For this purpose, a hole of the desired depth was made in the ground about 50 feet from the test structure by means of a mechanical post-hole digger. The thermocouples and their wires, enclosed in a rubber tube, were lowered into the hole and the earth was replaced around them. Thermojunctions were thus provided at about 1-foot intervals down to 13 feet below the surface as noted in Figures 3 and 4. The tube fitted the wires snugly, protecting the wires and the thermocouples from dampness. Because the tube wall was thin, and the temperature changes slow, it was considered unlikely that the rubber would cause significant error in temperature measurements. The results of the observations made on earth temperatures are shown in Figures 3 and 4.

Slab Floors Laid on the Ground

Results of the tests indicated that heat loss through a slab floor laid on the ground, when the floor and the ground outside the house are at substantially the same elevation, is more nearly proportional to the length of the "exposed edge" of the floor than to the area of the floor. "Exposed edge" here means an edge of the floor next to an exposed wall of the house, an edge imbedded in such a wall, or an edge on the outside of such a wall in contact with the ground, as in the case of a wall resting on the floor near the edge.

The heat loss of a floor laid on the ground is not proportional to the temperature difference between the air inside and the air outside of the house at any given instant. The floor heat loss appears to be dependent upon the temperature of the ground at some region beneath the surface, and this, in turn, depends upon the average temperature of the air above the ground and the amount of heat received by the ground from the sun and the amount of heat lost from it by radiation or otherwise during some period prior to the observation.

Heat Loss Factors Determined

For each of the floors, 1, 2, 3, and 4, the observed heat loss was divided by the length of the exposed edge, as defined above, and the result entered in the tables as "heat loss per foot of exposed edge." From this, the following three heat-loss factors were derived:

1. The heat loss in Btu per hour per linear foot of exposed edge was divided by the number of degree-days estimated to have occurred during the month preceding the observation, to yield factor F_1.

2. The heat loss in Btu per hour per linear foot of exposed edge was divided by the average temperature difference observed during each observation period between the air inside the structure and the air outside, to yield factor F_2.

3. The heat loss in Btu per hour per linear foot of exposed edge was divided by the average difference observed during each observation period between the temperature of the air inside the structure and the temperature of the ground 1 ft below the surface, at a distance of 35 ft from the structure, to yield factor F_3.

These factors are shown on Figures 5, 6, 7, 8 in bold type. How to use these factors to compute the heat loss of a floor is explained on Figs. 5, 6, 7, 8.

Heat losses estimated by means of F_1 may differ from those estimated by means of F_2 for two reasons: First, that the number of degree-days occurring during the month preceding each observation period was estimated from data in the ASHVE "Guide" by weighting the degree-days given for Washington, D. C., with respect to the time of the month when each observation period occurred. The degree-day data on which F_1 are based do not coincide, therefore, with what would be obtained if the temperature data obtained

(Text continued on page 208
Figs. 5, 6, 7, 8 on next two pages)

Figure 5

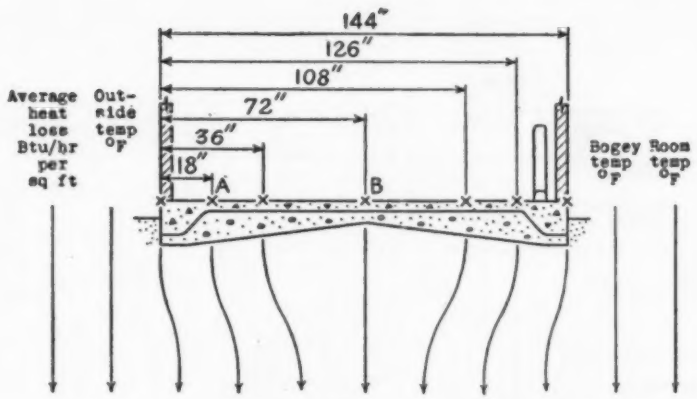
Floor No. 1

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	AVERAGE TEMPERATURE DEGREES F										
1.	Enclosed radiator	Jan. 27 to Jan. 31	6.63	31.5	43.7	60.0	62.8	64.5	64.2	65.4	48.5	38.6	70.6
2.	Enclosed radiator	Feb. 2 to Feb. 7	6.41	29.7	42.4	59.7	63.2	65.2	64.9	65.8	48.0	31.9	70.6
3.	Enclosed radiator	Feb. 9 to Feb. 13	6.72	27.5	41.9	59.4	62.6	64.8	64.4	65.3	47.0	34.6	70.2
4.	Unenclosed radiator	Feb. 16 to Feb. 21	5.89	31.0	44.7	60.4	63.5	65.6	66.5	66.7	49.9	37.9	70.2
5.	Unenclosed radiator	Feb. 23 to Feb. 27	6.06	31.4	44.9	60.8	63.6	65.8	66.6	66.5	48.9	34.4	70.3

Average gradient from point A to point B:

G = 0.0388 deg. F per foot for each degree F difference between point B and Bogey temperature.

Factors

$F_1 = 0.035$

$F_2 = 0.810$

$F_3 = 1.01$

To compute heat loss by Edge method:

Use $F_1 = 0.035$ or $F_2 = 0.810$ or $F_3 = 1.01$

F_1 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree-day occurring during month preceding observation.

F_2 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in average air temperature between the inside and outside of structure occurring during observation period.

F_3 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in temperature between the air above the floor and the ground 1 foot below the surface and 35 ft from the structure.

Figure 6

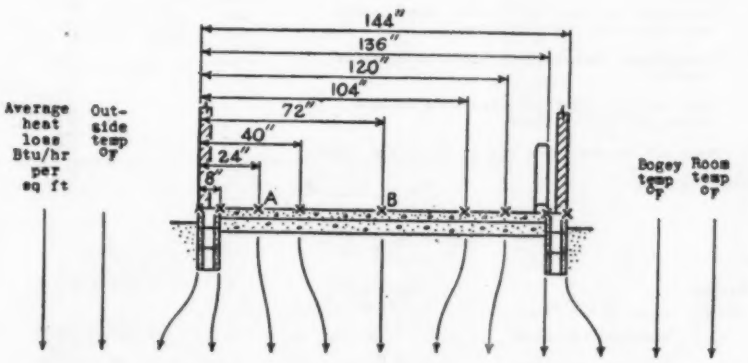
Floor No. 2

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	AVERAGE TEMPERATURE DEGREES F										
1.	Enclosed radiator	Jan. 27 to Jan. 31	5.69	31.6	40.7	55.0	61.8	----	65.2	65.0	66.1	58.7	37.3	38.6	70.5
2.	Enclosed radiator	Feb. 2 to Feb. 7	5.48	29.7	39.8	54.1	61.4	63.8	65.6	65.4	66.3	58.2	35.1	31.9	70.7
3.	Unenclosed radiator	Feb. 9 to Feb. 13	5.85	27.4	38.3	54.4	61.5	63.8	65.4	65.0	65.8	57.7	33.9	34.6	70.4
4.	Unenclosed radiator	Feb. 16 to Feb. 21	5.10	31.1	40.2	55.7	62.2	64.1	66.0	66.7[a]	67.4	60.4	37.7	37.9	70.2
5.	Unenclosed radiator	Feb. 23 to Feb. 27	5.92	31.4	41.3	56.5	62.4	64.4	66.1	66.6	67.7	59.7	36.1	34.4	70.4

Average gradient from point A to point B:

G = 0.0315 deg. F per foot for each degree F difference between point B and Bogey temperature.

Factors

$F_1 = 0.030$

$F_2 = 0.69$

$F_3 = 0.86$

To compute heat loss by Edge method:

Use $F_1 = 0.030$ or $F_2 = 0.69$ or $F_3 = 0.86$

F_1 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree-day occurring during month preceding observation.

F_2 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in average air temperature between the inside and outside of structure occurring during observation period.

F_3 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in temperature between the air above the floor and the ground 1 foot below the surface and 35 ft from the structure.

Figure 7

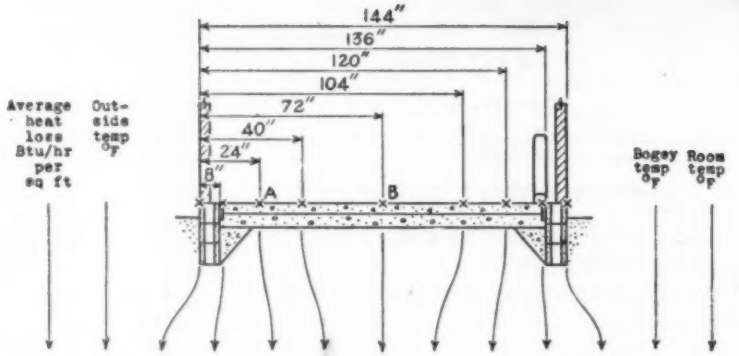
Floor No. 3

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	AVERAGE TEMPERATURE DEGREES F											
1.	Enclosed radiator	Jan. 27 to Jan. 31	4.46	31.6	35.8	59.9	62.6	64.1	65.3	65.4	66.5	64.5	39.3	38.6	69.9
2.	Enclosed radiator	Feb. 2 to Feb. 7	4.21	29.8	34.9	58.4	62.0	63.9	65.8	65.7	66.5	63.9	37.3	31.9	69.3
3.	Enclosed radiator	Feb. 9 to Feb. 13	4.25	27.8	33.2	59.2	62.2	64.0	65.5	65.7	66.7	64.1	36.8	34.6	69.9
4.	Unenclosed radiator	Feb. 16 to Feb. 21	4.09	31.3	35.9	59.8	62.9	64.5	66.0	67.1	68.5	66.4	40.0	37.9	69.9
5.	Unenclosed radiator	Feb. 23 to Feb. 27	3.85	31.4	37.1	60.4	63.1	64.6	66.1	66.9	68.0	65.8	38.2	34.4	69.5

Average gradient from point A to point B:

G = 0.0262 deg. F per foot for each degree F difference between point B and Bogey temperature.

Factors

F_1 = 0.023

F_2 = 0.55

F_3 = 0.68

To compute heat loss by Edge method:

Use F_1 = 0.023 or F_2 = 0.55 or F_3 = 0.68

F_1 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree-day occurring during month preceding observation.

F_2 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in average air temperature between the inside and outside of structure occurring during observation period.

F_3 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in temperature between the air above the floor and the ground 1 foot below the surface and 35 ft from the structure.

Figure 8

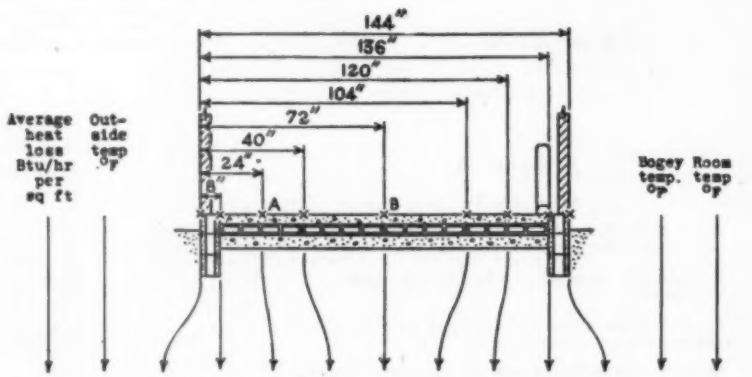
Floor No. 4

Cross section showing observed heat losses and temperate distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	AVERAGE TEMPERATURE DEGREES F											
1.	Enclosed radiator	Jan. 27 to Jan. 31	6.31	31.7	39.2	54.0	62.4	64.2	65.7	65.4	66.3	60.6	38.3	38.6	71.1
2.	Enclosed radiator	Feb. 2 to Feb. 7	6.09	29.9	38.4	52.2	61.4	63.7	65.6	65.4	66.2	58.7	36.3	31.9	71.3
3.	Enclosed radiator	Feb. 9 to Feb. 13	5.88	28.0	36.9	52.6	61.7	63.9	65.5	65.6	66.4	59.5	35.8	34.6	71.2
4.	Unenclosed radiator	Feb. 16 to Feb. 21	5.19	32.6	38.4	53.9	62.3	64.2	66.3	67.2	69.3	62.4	39.2	37.9	70.8
5.	Unenclosed radiator	Feb. 23 to Feb. 27	5.78	31.5	40.3	55.4	62.6	64.4	66.1	66.5	68.4	61.9	37.8	34.4	71.0

Average gradient from point A to point B:

G = 0.0309 deg. F per foot for each degree F difference between point B and Bogey temperature.

Factors

F_1 = 0.032

F_2 = 0.75

F_3 = 0.92

To compute heat loss by Edge method:

Use F_1 = 0.032 or F_2 = 0.75 or F_3 = 0.92

F_1 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree-day occurring during month preceding observation.

F_2 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in average air temperature between the inside and outside of structure occurring during observation period.

F_3 = Floor heat loss in Btu per hour per linear foot of exposed edge and for 1 degree F difference in temperature between the air above the floor and the ground 1 foot below the surface and 35 ft from the structure.

Part 2 of this article will appear in the next issue. Part 2 will present data for floors over crawl spaces.

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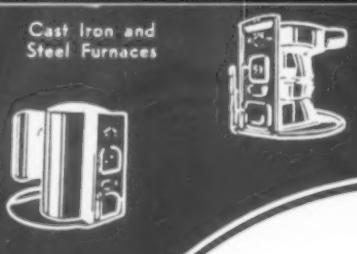

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The Year 'Round Line

The information presented in this article is based on the author's many years of practical experience, both under laboratory conditions and in the field. Of necessity the scope of this article cannot cover every case or condition and exceptions are bound to occur in different areas and on different jobs. Many competent air conditioning engineers and a great many more "near engineers" may disagree with some of the statements. However the many thousands of evaporative air coolers now in daily use, a large number of them in areas previously considered impractical for them, prove the soundness of the evaporative cooling principle. Nothing in this article is intended to reflect upon or criticize any particular brand or manufacturer of evaporative air coolers.

COOLING by evaporation of water or other liquids is as old as mankind. A wet hand placed in an airstream produces a cooling sensation. Bodies wet with perspiration are instantly chilled by a breeze.

Electric circulating fans depend on evaporating moisture from the body for their cooling effect. Mere circulation of hot air will not reduce air temperature one degree.

Evaporative air cooling units are simply a convenient device for producing cooling breezes for use in bringing relief from the heat in homes, offices, stores, or wherever people live, work or play. Scientific construction of these units provides more exact control of such cooling than that provided by nature.

By the simple means of enclosing an electric fan and a suitable evaporative pad, kept moist, in a cabinet and drawing warm air through the pad, clean, cool comfortable air is made available for use indoors.

Well designed units are inexpensive to buy, operate and install. Operating costs are negligible, expense being little more than ordinary desk fans.

Engineering, design and manufacture of dependable units is a task for qualified experts. However, rules for selecting reliable units, proper size, installation and operation are simple and require little in the way of special knowledge.

Selecting a Good Unit

As in all mechanical equipment, the product of an experienced and reliable manufacturer is the best guarantee of performance and long service. There are a number of such manufacturers of good units, but in this comparatively new field many organizations without experience in air handling and air

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Associate Member, A.S.H.V.E.; Member, American Society for Metals; Owner, American Metal Products Company, Fort Worth, Texas.

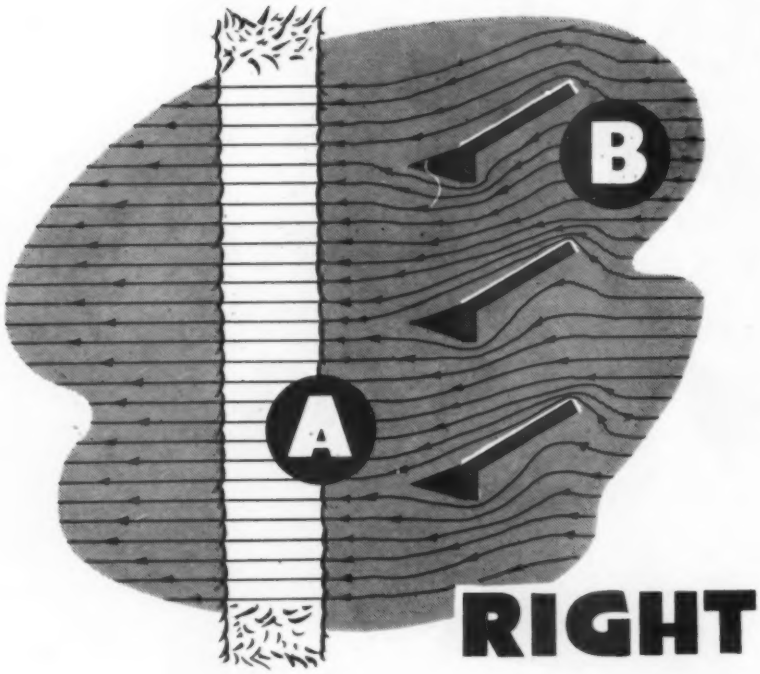


Fig. 1

Louvres should be placed away from the pad so that air streams through louvres may converge before entering pad. This minimizes collection of dirt on louvres (solid triangles) and insures maximum efficiency of cooler.

treatment have been offering poorly engineered units which "look good" and sell for cut rate prices. Practically all of these units are over-rated as to air capacity and produce excessive moisture. Many even deliver raw water through the fan blade into rooms and over floors and furniture. These inferior units are an incalculable detriment to the growth of this industry. Users condemn all evaporative coolers rather than the particular kind which gave trouble. Very evidently, "good" coolers should not be compared with "poor" ones.

Units built by hand methods or in small job shops should be especially avoided. While such builders may have the best of intentions, attitude is no substitute for engineering facilities and knowledge. Replacement pads and parts are rarely available from such sources and guarantees are uncertain. Bear in mind that well designed and constructed units last for many years.

Almost any unit will cool on very hot, dry days and for a limited length of time. Well engineered units will consistently perform under adverse conditions and when those of poor design are useless. Length of trouble free service is far greater.

Cabinets which house cooling apparatus should be of substantial materials and have durable paint finishes. Metal sheets used should be Electro-galvanized and bonderized or the equivalent. Spot welding should be avoided in the bottom of a unit or water reservoir, or else the welded spot should be covered with solder. Bare metal or improperly protected spots will soon rust through. Paint applied over ordinary galvanized iron will soon flake and peel. Bonderizing or equivalent greatly improves paint adhesion. The design and color scheme of cabinets should be such as to please the eye and harmonize with building in which units are installed.

Motors should be of reliable make with provision for oiling. Oiling should not be required more than twice per season. Motor RPM. should not exceed 1,500. This permits minimum power consumption and lessens noise of air delivery. Fan motors should be mounted in a flexible manner in order to minimize transmission of noise to the metal cabinets.

Fan blades should be of aluminum and have broad wings. Best types practically cover the fan opening in a unit and move more air with less horsepower and noise. Blades must be carefully balanced to eliminate "lope" and consequent noise and damage to motor bearings. Steel blades place undue starting load on a motor and shorten its life.

The Evaporative Pad

Evaporative pads should be made of highly absorbent materials which will not sour in water and thus produce objectionable odors. Non-absorbent materials permit droplets of water to bounce about freely. These droplets frequently fall into path of air being drawn into fan and are subsequently deposited on floor and on furniture in room. Grains of moisture are more readily introduced into air-stream and precipitated in dead corners or elsewhere in building. Absorbent materials "wick" water down under good control and rarely escape from the pad. Aspenwood fibre is used by practically all experienced manufacturers. Such fibre is highly absorbent and contains little or no sap to sour in water.

Evaporative pads should be supported in place in a non-sag manner. Hard or tight spots should be avoided as they restrict airflow. Sagging or improper fit around edges results in openings through which mosquitoes, other insects, and hot air will be drawn into building. The supporting envelope must be of sufficient porosity to permit free and unhindered passage of air.

Pads supported by "prongs" or quilting ties alone soon sag. Wire mesh envelopes over inner envelope of mosquito netting are best for non-sag support of pads.

It is important that pads should be easy to change. This is usually done each year, especially in dusty localities, and considerable time and expense is involved in this if an easy method for such change is not provided by manufacturer.

A proper size pad is of vital importance. Pads that are too thin result in insufficient evaporation and sub-

stantially less cooling. Pads that are too thick retard airflow and reduce capacity of fan to move air.

Pads that are too small in height and width are worst of all. Two undesirable results are brought about by pads that are too small:

1. Resistance is provided to airflow which sharply reduces capacity of unit. Undersized pads can usually be detected by passing hand in front of and close to the revolving fan blade. Large blank or dead spots will be found in the center and around edges of the blade. Most of the airflow will be felt *between* the center and edges of blade. Delivery will be noisy and "choppy."

2. Speed of air through the pad will be accelerated beyond the safety point and will result in excessive humidity without gain in cooling effect. Speed of air drawn through the pad should not be less than 250 nor more than 300 linear feet per minute. Air speed through pad can be roughly calculated by dividing rated air delivery per minute of unit by area of pad in square feet.

Example: Unit capacity in cubic feet per minute . 2,500
Area of pad in square feet 9

$$\frac{2{,}500}{9} = 277 \text{ linear feet per minute.}$$

Accuracy of results obtained by the above formula is dependent on accuracy of manufacturer's rating of unit.

Air Intake to Evaporative Pad

Earlier models of evaporative coolers had hardware cloth or other coarse wire mesh covering intake openings with the pad laid against mesh and frequently secured to it. Resistance of this mesh was insignificant and good results were obtained. However, as time went on, customers became more critical of appearance and especially objected to the unsightly appearance of exposed pads.

As a result, many manufacturers resorted to metal sheets over pads with slots or louvers provided for entrance of air (Figs. 1 and 2). Pad sizes were not increased because of the cabinet size which would have been required. As a result, the capacity of the unit to deliver air was reduced as much as 50 per cent while rated capacity on literature remained unchanged. This restriction of entrance of air caused increase of air speed through pad which substantially added to moisture content of air, and as the pad was laid against metal sheets, dirt quickly accumulated on louvers and against pad (Fig. 2), thus further restricting the entrance of air. Rain in large quantities was admitted to the pad, which made operation of fan only for air circulation during rains impractical. These louvered sheets did improve appearance, but at a great sacrifice in efficiency.

Louvers or slots are excellent if proper arrangement of pad is made. If pad area is correct, advantage may be taken of a usually overlooked principle which will permit use of a louvered sheet of same size as pad, with virtually no detrimental effects. Appearance of units can thus be greatly enhanced.

If louvers or slots have sufficient free area for quantity of air being handled, placing pads 1½ to 2 inches away from the louver will solve the problem (Fig. 1). This will permit the airstream, which has been split by spaces between open slots, to reconverge *before* entering pad (Fig. 1) and thus utilize all of pad's area. This method also blocks all but a very small quantity of rain entrance and permits use of "fan only" for very desirable air circulation. As no trough is formed by this method, dirt stacking up is virtually eliminated.

Speed of the airflow through the slots govern length of hole, or slot in airstream, before closing or reconverging. Airspeed through louvers should not be too high because excessive resistance caused will lessen the quantity of air delivered by the fan.

To sum up: No louvers or slots should be used, especially on units equipped with propellor type fans, unless pad is set back in such manner as to permit air to reconverge.

This is the first of approximately five articles in a series prepared by Mr. Marsalis, and intended to discuss every angle of this important postwar activity.

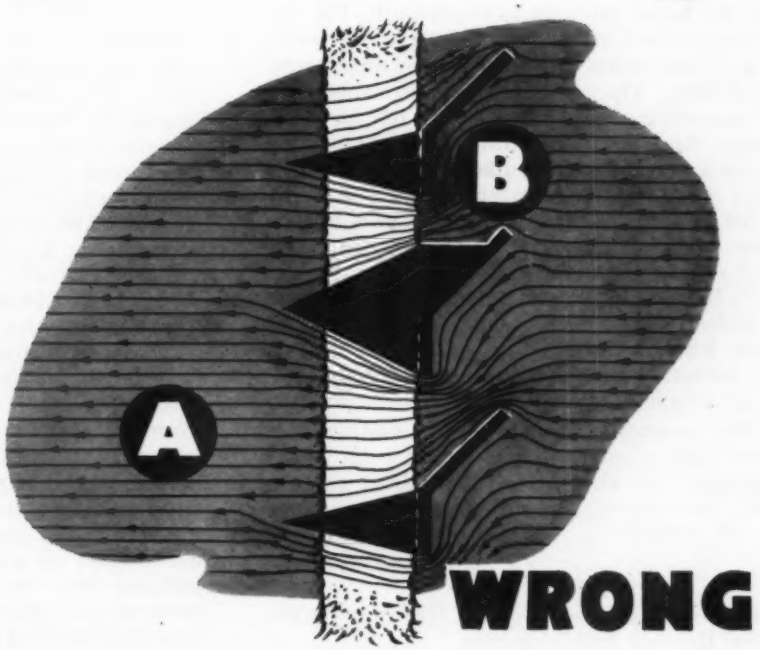
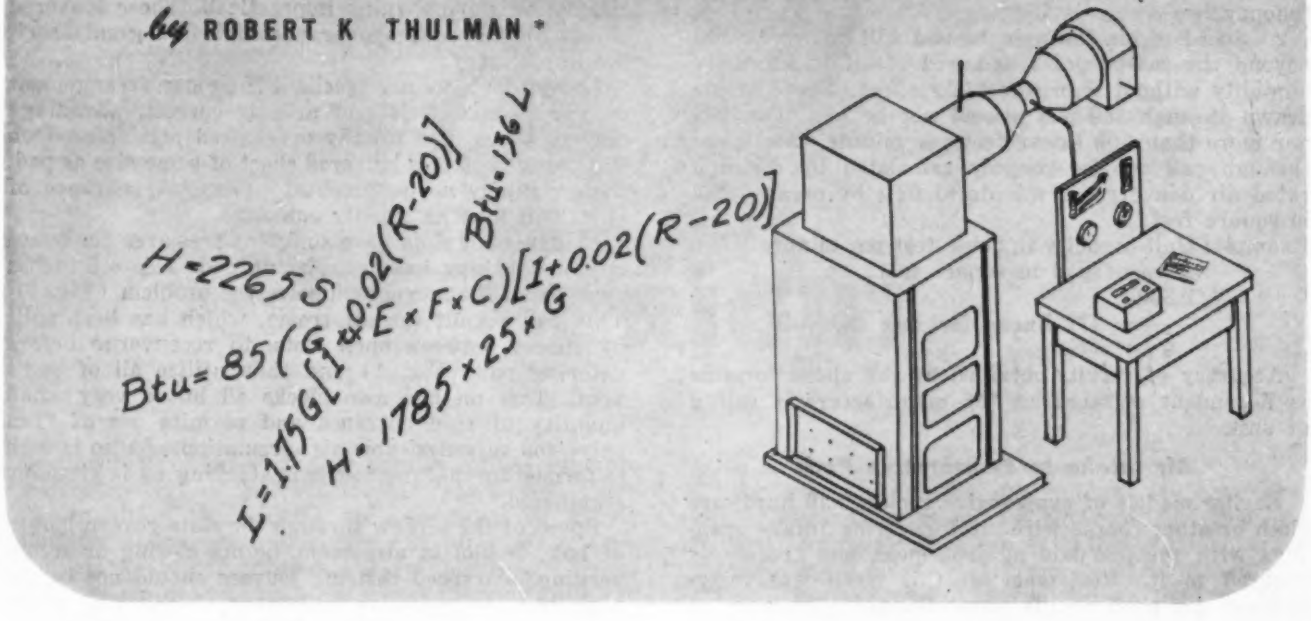


Fig. 2

When louvred openings are placed against pad, dirt accumulates rapidly (solid triangles); this dirt restricts air opening and makes "dead" areas in pad. Efficiency is greatly reduced.

Formula for EXTENDING the Acceptance of Warm Air Heating

by ROBERT K THULMAN *



MANY problems confront the purchaser of a new home—the selection of an architectural style of lasting appeal, construction materials, location, cost—but none is more important than the selection of a suitable method of heating. To insure that the heating system is appropriate, that it will heat the house economically and effectively, and that it will last a reasonable time, requires a degree of technical knowledge often beyond the home owner's experience and capabilities. When the house he buys is ready-built, the decision has already been made and usually it has been made by the builder with the primary considerations based on first cost. The quality of performance, the economy of operation and the durability of the heating equipment, items of major interest to the home owner, are not apt to be given sufficient consideration by the builder. The purchaser must depend to a great degree on his confidence in the builder and in the manufacturer of the equipment. Frequently his confidence in the manufacturer is based upon the old guarantee: "I will replace parts manufactured by me which are defective." That confidence is sometimes badly shaken when the owner realizes that the replacing of a defective part in a system which itself is a failure is of no great benefit to him.

Much of the assurance of satisfactory heating that a home owner enjoys comes from sources with which he is unfamiliar. He knows too little about the research work, the formulation of standards and the publication of installation codes carried on by the heating industry. These enterprises serve the dual purpose of home owner protection and of continued public acceptance of the type of heating to which they apply. Progress in some phases of this sort of activity has, however, not been as rapid as it might have been. For example, it has been generally conceded that the rating of furnaces should be determined by test rather than by formula.

Test vs. Formula Furnace Rating

The rating of furnaces by dimension formula has been the accepted practice of the industry for many years. The new Codes and Manuals of the National Warm Air Heating and Air Conditioning Association contain revisions of rating formulae for both gravity and forced air furnaces based on re-study of the data of the original tests conducted at the University of Illinois. The basis for both the original and revised formulae is admirably described in the University's Bulletin No. 19, "Rating Equations for Hand Fired Warm Air Furnaces," recently published. The new formula, like the old, provides for the determination of furnace output by relating it to the area of the heating surface and the ratio of that surface to the area of the grate. Comparison of the old and new formulæ is made on the basis of Btu output per square inch of grate area and is shown in the chart. An examination of the original test data shown in Bulletin No. 19 and a comparison of the capacities limited by 800 degrees F. flue gas temperature with the capacities determined by the new formula for gravity furnaces indicate that the new formula still does not evaluate properly the output of furnaces with low ratios. Further data derived from tests conducted at the National

**Chief, Mechanical Equipment Section, Underwriting Division, Federal Housing Administration.*

Bureau of Standards indicate that construction features such as tightness of doors or the design of casings, not accounted for in the formula, seriously affect the furnace output.

New furnace designs are already appearing and it seems likely that many more will follow. Some of these designs are strikingly different from those tested at the University of Illinois on the test performance of which the formulae are based. The need for a test procedure which will discover the proper output of this type of furnace is apparent. The present Commercial Standards covering warm air furnaces do not include test procedures for gravity furnaces.

Do We Need "Pitch" on Gravity Leaders?

Gravity systems are widely used and their use was greatly increased during the war period due to the shortages of fans and fan motors. The simplicity, continuousness of heat output, operating economy and low first cost of the gravity system recommend it for use in lower cost housing. The new Gravity Code and Manual is an important advance in bringing up to date the principles and practices of the gravity system.

It is quite probable that improvements in the design of the gravity system can be made which will overcome two of the common objections to it—sacrifice of headroom and large size pipes. The Code and Manual specifies that the leader pipes shall pitch upward in the direction of flow one inch per foot. An early investigation of the question of pitch made at the University of Illinois is reported in Bulletin No. 45. Tests made on an arrangement consisting of a round leader pipe with a vertical rise containing two 90-degree elbows followed by a horizontal section indicated that the carrying capacity of this type of run was substantially the same as that for a run in which the leader pipe had a uniform pitch from bonnet to boot. If the leader pipes are arranged with a vertical rise to horizontal runs just below the ceiling, the advantage gained in headroom around the furnace is obvious.

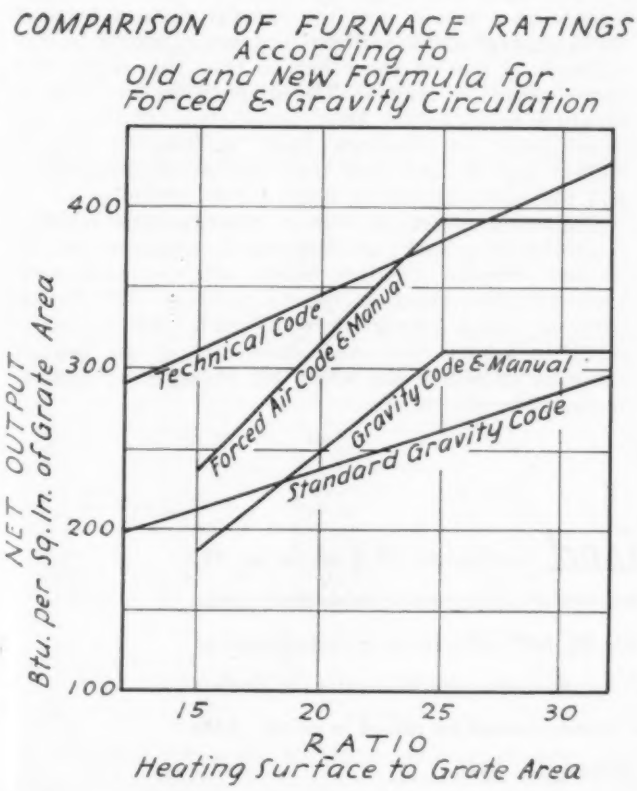
Low Resistance Fittings Essential

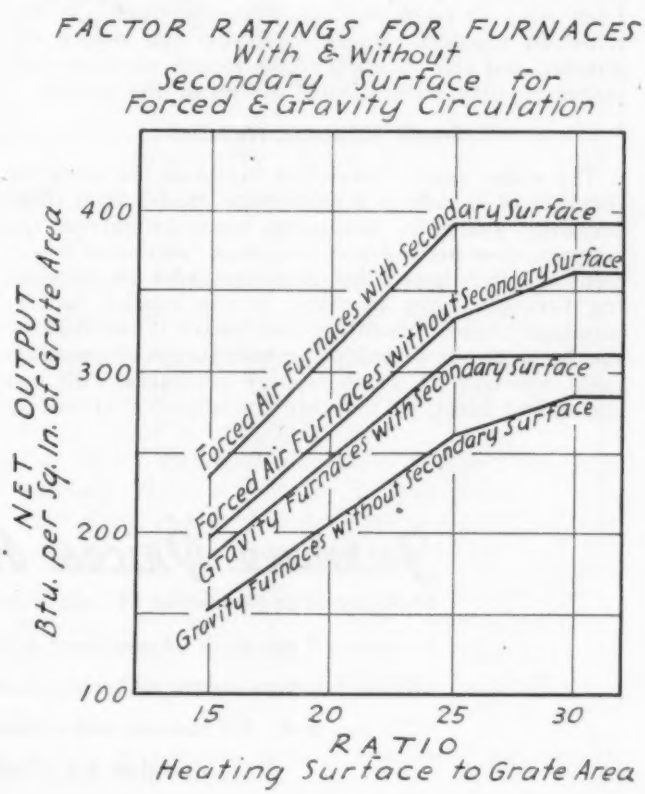
The available head for circulating warm air by gravity is provided by the difference in weight of two columns of air; one hot, the other cold. The available head is small but positive, nevertheless. It is necessary that the frictional resistance through the system be kept at a minimum if a large volume of air is to be circulated. Improved furnace casing design to reduce the resistance to air flow, streamlining of the leader collars and bonnet to reduce the entrance loss, more uniform distribution of the return air to the casing or an application of the pipeless furnace principle of casing design with the dividing baffle insulated, are suggested as profitable items of investigation to increase the air flow through the system and might make it possible to circulate air in sufficient volume to reduce the temperature rise limit to the same magnitude now specified for forced warm air systems.

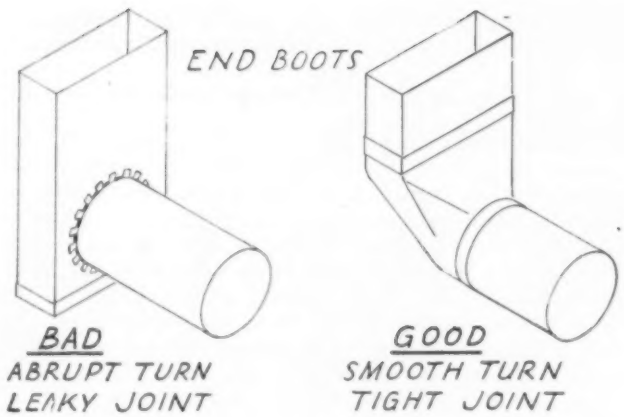
The resistance through fittings can also be reduced through improved design especially where fittings are used to accomplish changes in both direction and shape as at the base of a riser. The recommended boot designs shown in the Manual offer little resistance to air flow, but in installation practice they are frequently not used, the round leader pipe being connected directly to the base of the stack with a clinch connection. The resulting joint is apt to leak and the change in direction is abrupt, resistance is high.

Forced Air Improvements

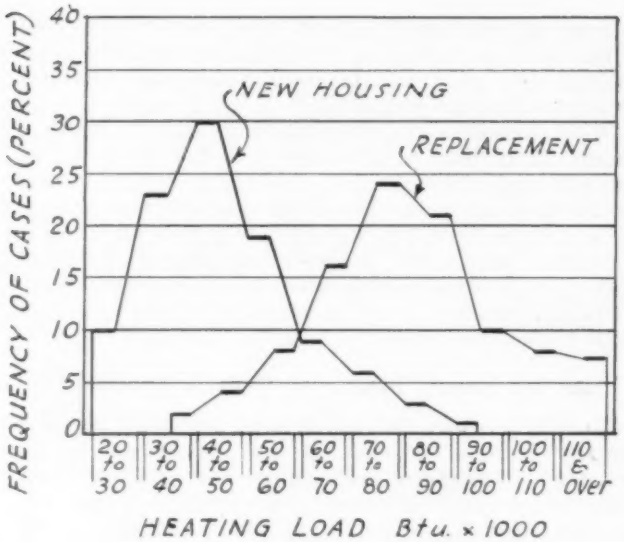
The desirable design principles of forced-air systems should be more diligently applied to improve the performance and operating economy of this type of system. Lower system resistance results in lower







Boot designs recommended in the new Manuals should be strongly urged in order to eliminate excessive friction and air loss. These fittings demonstrate good and bad boots.



The Postwar furnace sizes most frequently needed are shown here. Note that for replacement purposes 60,000 to 100,000 Btu capacity furnaces are mostly needed whereas for new houses 30,000 to 60,000 Btu is the range mostly used.

power costs, and the natural, though perhaps unfounded, objection to continuous fan operation could be largely overcome. Smaller fans operating at slower speeds might reduce fan noise to a point where it is never objectionable. The streamlining of registers could reduce the air noise originating at the outlet.

All of the elements of a thoroughly satisfactory thermal environment can seldom be provided by a single method of heating unless low first cost is no object. Some of these elements are supplied in part by construction features of the house itself. The warmed-floor feature of the floor heating system is present to some degree when the house has a basement and there is some loss from the system into the basement area; the humidity in a small, tightly constructed house is apt to be maintained at a satisfactory level by slow escape of moisture from normal bathing, cooking and laundry activities. A compact architectural plan provides better air distribution from room to room and simplifies the warm air distribution problem. House insulation can reduce the number and size of supply and return openings and makes possible more flexible design of the system.

Small Furnaces Needed

The wider use of insulation indicates the need for furnaces of capacities considerably smaller than those presently available. Insulation tends to narrow the range of sizes necessary to provide a full line of equipment and it is hoped that manufacturers are developing furnaces more adaptable to the smaller, better-insulated house. Insulation also makes it possible for the home owner to enjoy the advantages of premium fuels, the cost of which is high compared with less convenient fuels, by reducing the annual fuel cost to a point where it can be afforded. The owner's decision to forego the advantages of high-cost fuels is usually made because the total annual cost of heating with these fuels is beyond his means and not because the cost per available Btu is higher than that of less desirable fuels. More consideration, therefore, might well be given by manufacturers to the broader development of automatically-fired equipment of smaller capacity.

Manufacturer-Dealer Guarantee

The responsibility for satisfactory operation of the system as a whole, now too sharply divided between manufacturer and installing contractor, should be centralized on one or the other so that the owner may know where he stands. The disposition has been to separate manufacture from installation, to blame unsatisfactory performance upon installation and to neglect the obvious fact that equipment, installation and the house should be regarded as a whole.

Continued research, closer manufacturer-installer relationship, product and system development leading toward simpler, smaller, more efficient equipment, capacity determinations based on test rather than formula, and a broader sense of public service can do much to assure continued prosperity of the heating industry of which the warm air industry is such an important component.

◆

Furnace Prices Raised—Amendment 3 to Order 48, Maximum Price Regulation 591 allows manufacturers of oil burners to raise their prices to dealers 9 per cent. Amendment 4 to Order 48, MPR 591 allows manufacturers of oil fired furnaces—where oil burner is sold with furnace—to raise their prices to dealers 12½ per cent. Oil furnaces sold without the burner cannot be raised in price. Both orders are effective January 14, 1946.

The "How, What and Why" of the New Winter Air Conditioning Manual

BY
S. KONZO*

HOW TO USE IT
WHAT RESEARCH BACKS IT UP
WHY EVERYBODY SHOULD ADOPT IT

Equivalent Length of Registers

FOR the purpose of heating a room with a warm-air heating system, a duct system is provided to transport heated air to the room. The less resistance we have in the duct system the easier the air will flow to the room. Why, therefore, shouldn't we merely have a hole in the wall for the air to enter the room? Wouldn't a stackhead alone have less resistance than a warm-air register placed at the opening? In other words, is there any justification for a register?

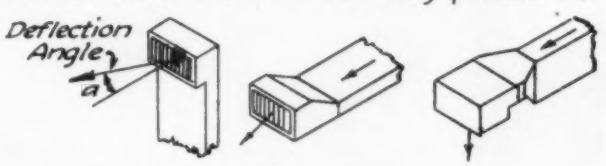
Registers can justify their existence only if they can definitely provide one or more of the following features:

1. They must "glorify the hole in the wall." They must be decorative without being gaudy. They must fit into the wall structure and become part of it, and not a sort of afterthought attachment.
2. They must serve as a means of controlling the *distribution* of the air into the room. If air must be controlled upwards or downwards or sideways, a good register will do it, but a hole in the wall will not. In most cases an adjustable deflecting register is the only means available to avoid having the air "scrub" nearby ceiling or wall surfaces, or to reduce the velocity of the air stream in front of the register.
3. They must serve to control the *volume* of air entering the room. When no heat is required, the air must be throttled to an insignificant amount.
4. They must not add materially to the resistance

*Special Research Professor, Engineering Experiment Station, University of Illinois.

GROUP 7. Registers (Including losses in stackhead and velocity pressure)

TABLE 7.
Equivalent Length for Registers.
(See diagrams at right)



Deflection Angle a.	Baseboard or Low Sidewall Register	High Sidewall Register For throw of air of: less than 13 feet	High Sidewall Register For throw of air of: over 13 feet
0°	35 Eq. Ft.	35 Eq. Ft.	70 Eq. Ft.
15°	40 " "	40 " "	80 " "
22°	45 " "	45 " "	90 " "
30°	60 " "	60 " "	115 " "
45°	115 " "	115 " "	230 " "

Notes for Table 7.

a) When turning vanes are used in stackhead use 0.7 of values in columns 2 to 4.

b) Values shown in 2nd and 3rd columns in Table are for 6 in. height registers (Standard height). and those in 4th column are for 4 in. height registers.
For 5 in. height registers, multiply values in Col. 2 and 3 by 1.3
For 8 in. height registers, multiply values in Col. 2 and 3 by 0.8

c) For 2-way deflection registers, add the vertical and horizontal deflection angles together and multiply by 0.7. Select closest angle "a" in Col. 1 of Table 7.

Fig. A—Table 7 from the Manual shows how resistance builds up rapidly as deflection angle is increased. Resistance is expressed in terms of equivalent length for a register.

of the stackhead. Believe it or not, it is possible to place some types of registers in a stackhead opening and actually obtain a smaller resistance to air flow than that obtained with an open stackhead.

What Does the Manual Say?

Pressure losses can also be expressed in terms of equivalent lengths (AA, Dec. '45). This term is a unit which expresses the friction loss of a fitting or a register in terms of the number of linear feet of a straight duct. For example, if a register has an equivalent length of 35 feet, that means that the friction loss of the register is the same as that imposed by 35 feet of straight duct.

Examine Fig. A carefully. The fact that it is compact and lacking in lengthy explanations should not lead you to the conclusion that it doesn't have much technical backing. Three years of test work with close to 100 different types of registers was conducted in the laboratory. It may be noted that with wide deflection angles the equivalent length of the register alone may exceed 100 feet, which in many cases is as great as the equivalent length of the entire duct system. In the following discussion, the highlights of the results published in Experiment Station Bulletin No. 342 will be given. This report, entitled "Pressure Losses in Registers and Stackheads in Forced Warm-Air Heating," is available at a cost of 65 cents from the University of Illinois Engineering Experiment Station, Urbana, Ill.

Why Rule Out "Punched Grille" Registers?

A "punched" or perforated grille type register is merely a cover over an opening in the wall; it has no

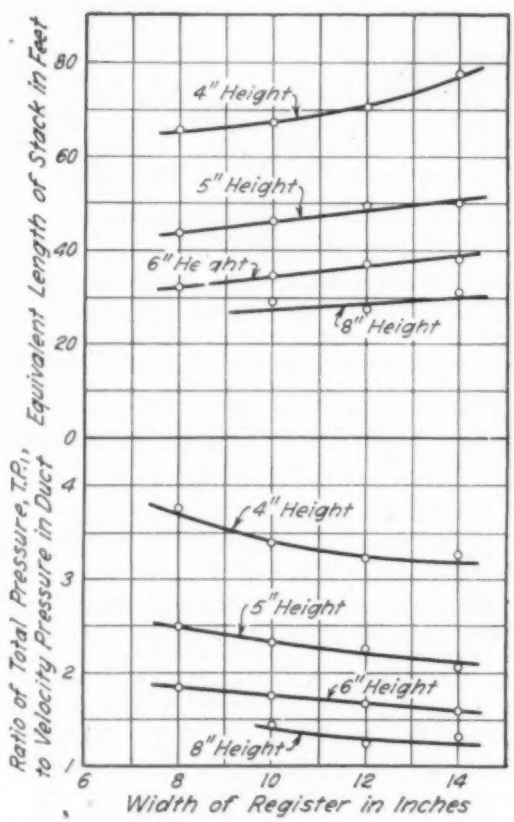


Fig. C—Total pressures for various combinations of stackheads and registers.

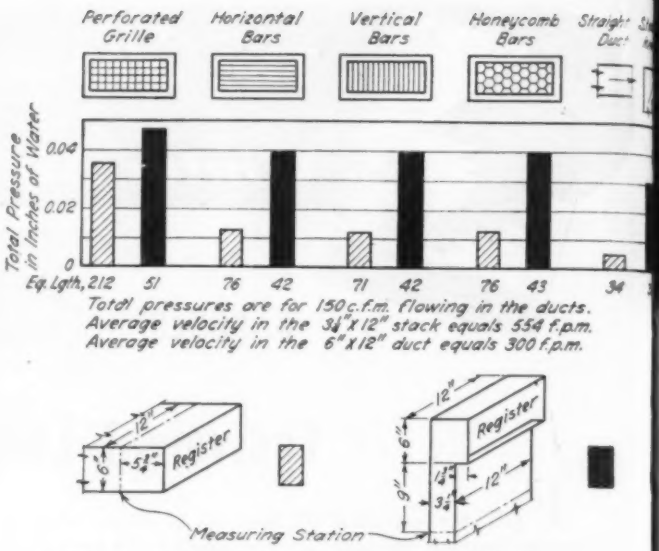


Fig. B—Total pressures for registers attached to stackhead and to end of straight duct. Note how stackhead increases the total pressure.

provisions for controlling the direction of the air stream and it offers more resistance than the "bar" type registers. Fig. B shows a summary of a number of tests made to determine the relative resistance of both types of registers. The cross-hatched bars indicate that when the registers were placed at the end of a straight duct, the perforated grille register had about three times as much resistance as the bar types. When the registers were attached to a stackhead, the combined resistance of register and stackhead, as shown by the solid bars, was about 20 per cent greater for the perforated grille than for the bar type. In the Manual, therefore, the "punched grille" type register has not been specified.

It is interesting to note that the open stackhead without register has a resistance of 33 equivalent feet or about 80 per cent of the resistance of the same stackhead with attached register.

Why Specify a 6-In. High Register?

The top set of curves in Fig. C shows the equivalent lengths for various heights and widths of registers. The following conclusions can be drawn from the curves:

1. The width of the register has relatively little effect on the equivalent length. For example, a register 8 in. wide and 6 in. high has a resistance equal to about 32 equivalent feet, while that for a register 14 in. wide and 6 in. high has about 38 eq. ft. For all practical purposes, therefore, a value of 35 eq. ft. can be applied to all registers that are 6 in. in height.

2. The height of a register has a decided effect on the resistance; decreasing the height of the register results in an increase in resistance. For example, for registers that are 12 in. wide the equivalent lengths were as follows:

Height of Register	Equiv. Length	Resistance Compared with that for 6 in. height
4 in.	71 feet	1.9
5 in.	49 feet	1.3
6 in.	38 feet	1.0
8 in.	27 feet	0.7

In other words, a 4 in. height register has almost twice as much resistance as a 6 in. height register, and a 5 in. height has about 30 per cent more. The

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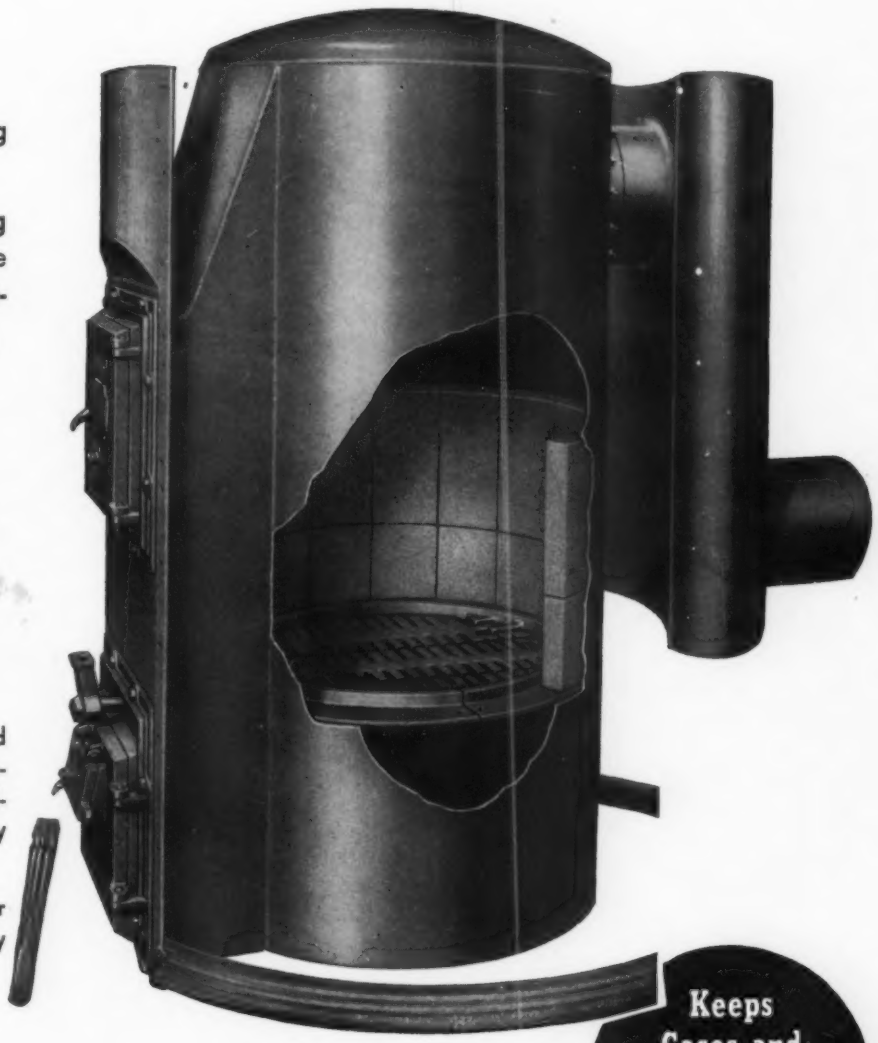

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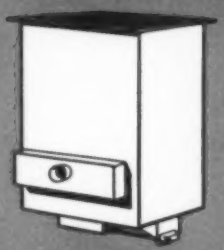

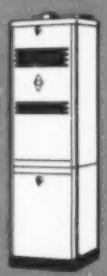

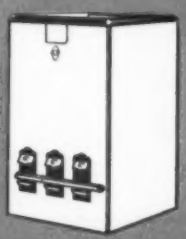

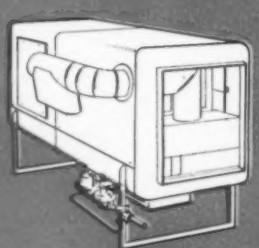

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Ratio of Loss in Total Pressure for Vanes Set at Angle "a" to that for Vanes Set at 0 Degrees

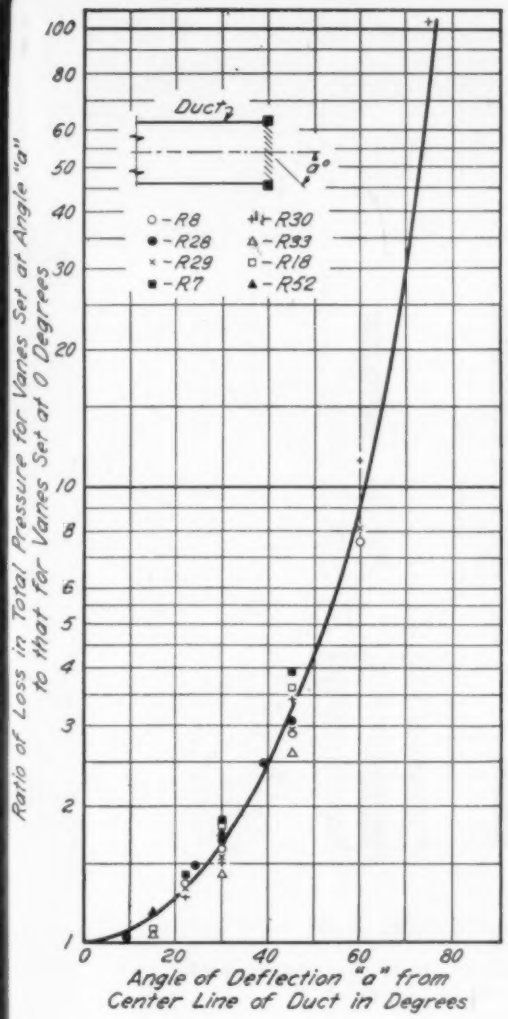

Fig. D—Increase in pressure loss with different angles of deflection expressed as a ratio of resistance with no deflection.

equivalent feet values shown in Fig. A, therefore, were based on a standard height of 6 in. Note (b) in Fig. A shows how other heights can be taken into account.

For high sidewall registers requiring sufficient velocity to throw the air across a long room, the Manual specifies a standard 4 in. height register. The values shown in the last column of Table 7 in Fig. A are twice as great as those shown for the 6 in. height registers and were determined from the data in Fig. C.

Why Avoid Deflection Angles Over 22 Deg.?

The first column in the table given in Fig. A lists various deflection angles from 0 deg., or no deflection, up to 45 deg. This deflection angle is the angle that the air is deflected at the face of the register by the bars in the register. Eight different registers, of the adjustable deflecting types, were tested and the results are summarized in Fig. D. The pressure losses for various deflection angles from 0 to 75 deg. were compared with those when no deflection was used. The resistance increases at a tremendous rate when the angle of deflection is increased, particularly when the angle exceeds 22 deg. For example, if we consider the resistance of a register for no deflection as unity, the resistances for varying deflection angles increased as follows:

Deflection Angle	Resistance Compared with no Deflection
0	1.0
10	1.1
20	1.2
30	1.7
40	2.5
50	4.3
60	9.0
70	30.0

TABLE 7

TOTAL PRESSURES FOR ADJUSTABLE, DEFLECTING TYPE REGISTERS

Register No.*	Test No.	Deflection†	Pressure Loss Ratio, $\frac{T.P.}{V.P.}$ for 0 degree Deflection			Total Pressure¶ Ahead of Register, in Inches of Water for Angles of Deflection of						
			At 300 c.f.m.	At 1500 c.f.m.	Average	0°	15°	22°	30°	45°	60°	75°
1	2	3	4	5	6‡	7	8	9	10	11	12	13
R8	1K to 5K	To right	3.06	2.73	2.90	0.140	.....	0.188	0.226	0.408	1.070	.....
R28	28K, 36K, 37K	To left	2.49	2.08	2.28	0.109	.....	.....	0.185	0.336	.....	.....
R29	11K to 16K	To right	2.32	2.07	2.19	0.107	.....	0.142	0.165	0.316	0.874	4.44§
R7	17K to 20K	Down	2.92	2.50	2.71	0.132	.....	0.189	0.244	0.517	.....	.....
R30	21K to 26K	Down	2.67	2.40	2.53	0.124	.....	0.156	0.186	0.428	1.420§	13.10§
R33	32K to 35K	Right and left	3.21	2.86	3.03	0.147	0.157	.....	0.213	0.380	.....	.....
R18	3D to 6D	Down	2.38	1.86	2.12	0.101	0.109	.....	0.181	0.367	.....	.....
R52	38K, 41K, 44K	Back—none Front—right and left	3.74	3.14	3.44	0.166	0.195	.....	0.283	.....	.....	.....
R52	39K, 42K, 45K	Back—15° down Front—right and left	....	....	....	0.190	0.213	.....	0.299	.....	.....	.....
R52	40K, 43K, 46K	Back—30° down Front—right and left	....	....	....	0.270	0.283	.....	0.360	.....	.....	.....

						Angle of Deflection						
						−6°	0°	9°	24°	39°		
R28	27K to 31K	Right and left	2.49	2.08	2.28	0.119	0.109	0.112	0.163	0.270	.....	.....

†Facing outwards from inside of duct.
‡All data in this column, except for R18, included in Fig. 3.
¶Determined for duct velocity of 900 f.p.m
§Curve extrapolated to 900 f.p.m.

In this Table 7, the resistance expressed in inches of water is, in all cases, for 900 fpm. velocity so the actual resistances for different registers and different angles of deflection can be compared and read directly in inches of water resistance.

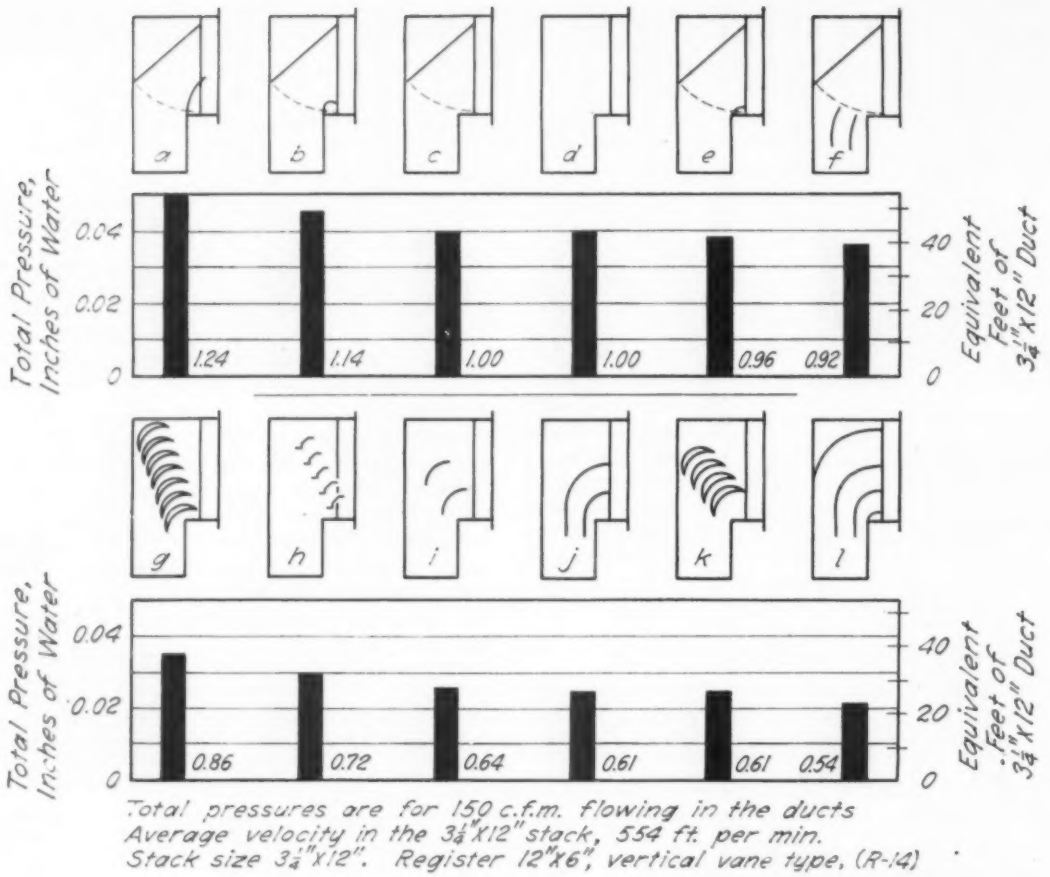

Fig. E—Pressure losses as affected by turning vanes in the stackhead. Note that the type of vane and location of vane has greater influence than number of vanes.

It can be observed that deflection angles exceeding about 20 deg. result in excessive pressure losses and are to be avoided except in those cases where it is deired to damper or restrict the air flow to a room. Hence, in the Manual the recommendation is made that deflection angles be limited to about 22 deg.

When two-way deflection is used, note (c) in Fig. A shows how the equivalent lengths can be calculated. The rate is based on tests in which a large number of combinations of downward and sideways deflections were used. For example, for the following combinations the values given in Table 7 can be used with reasonable accuracy:

For Downward Deflection of	Combined with Sidways Deflection of	Use Values in Fig. A for Angle of
10 deg.	10 deg.	15 deg.
15 deg.	15 deg.	22 deg.
22 deg.	22 deg.	30 deg.
30 deg.	30 deg.	45 deg.

In this case, also, deflection angles exceeding about 22 deg. should be avoided as far as possible.

Are Stackhead Vanes Any Good?

Fig. E shows tests of twelve different stackhead arrangements. Cases (c) and (d) represent conventional stackheads without any modifications. The following observations are of interest:

Cases (a) and (b)—Smoothing out the sharp corner at the throat restricted the register opening and increased the pressure loss.

Cases (c) and (d)—Whether or not the register damper was in position had little effect on resistance.

Case (e)—Smoothing out the sharp inner corner had a slight beneficial effect.

Case (f)—Two curved vanes in the stackhead throat reduced resistance about 8 per cent, which is not enough to justify the complication.

Case (g)—Massive turning vanes that practically filled the stackhead, surprisingly enough gave a pressure reduction of 14 per cent.

Case (h)—A commercial register having attached splitters gave a 28 per cent reduction, which is a significant reduction.

Case (i)—This simple splitter construction consisting of two sheet metal pieces attached to the sides of the stackhead gave a surprising reduction of 36 per cent. The note (a) in Fig. A was specifically directed towards cases (h) and (i).

Cases (j), (k) and (l) show that reductions of from 40 to 45 per cent are possible with more complicated splitter and vane constructions.

It should be noted that cases (i) to (l) give total resistances for register and stackhead that are substantially smaller than the resistance of an open stackhead without any register. As Ripley would say, "believe it or not."

This then is our story about registers. The selection of sizes and types specified in the Manual are based on comprehensive tests involving thousands of measurements and countless man-hours of work and analysis. We feel sure that we are on a firm footing. Thanks to the whole-hearted cooperation of the register manufacturers, the warm air industry is able to definitely specify "what and how" and then back up the recommendations with data.

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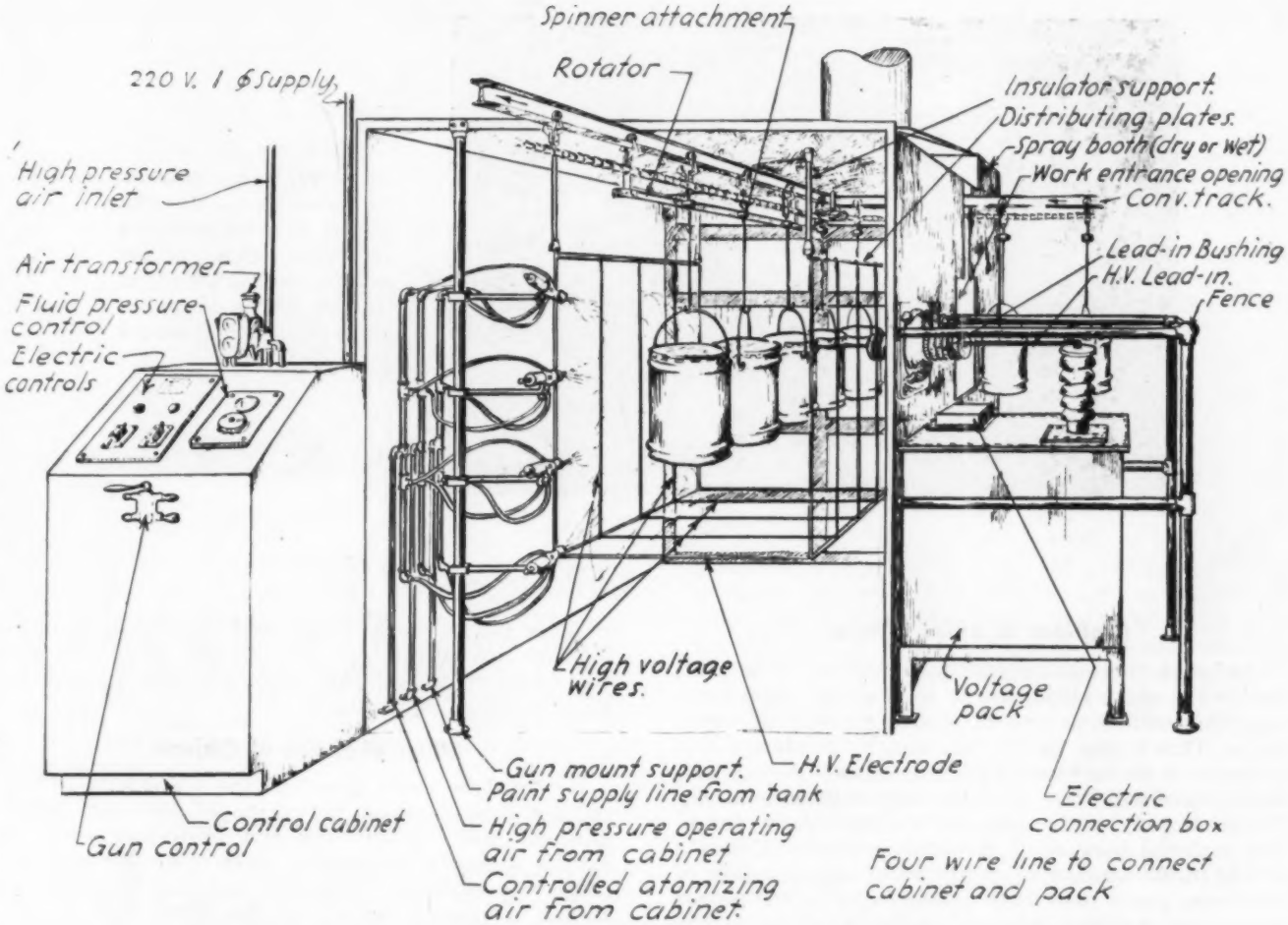


This schematic drawing (courtesy Harper J. Ransburg Co., Indianapolis, manufacturers of equipment) of an electrostatic spray painting installation shows the grid of wires which makes the electrostatic field and typical electrical equipment necessary for an automatic painting installation.

Electrostatic Principle of Spray Painting

By Stanley T. Dingman

INDUSTRIAL processes during the past few years have been characterized by an ever-widening use of electrical energy other than that required as the driving power for motors and machines. This has been brought about by two factors: (1) a greater understanding of energy characteristics, and (2) a knowledge of how to generate and control energy to secure the desired effect.

One of the more recent and unusual of these applications of electrical energy to industrial processes is for influencing the directional flow of finishing materials. In the spray-coating of products, electrostatic energy *attracts* the finishing material to the object being finished. In the detearing of dipcoated products, electrostatic energy *removes* the excess material that accumulates at drain-off points. In both these finishing operations the electrostatic principles effect considerable savings of finishing materials.

Basically, the function of the electrostatic principle is the same in both operations, although spraying and detearing might be considered as being diametrically opposed, since in the first process material is applied to a product, and in the second, material is removed. But, in both instances, an electrostatic field is set up to attract the finishing material to the desired place. In the spraying operation, the paint, lacquer, or enamel is atomized into an electrostatic field, where the minute particles are energized and attracted to the product being coated. In the detearing process, items which have been dip-coated are conveyed over an electrical grid or drainboard, which exerts an attraction for the fluid material. Since this attraction is strongest at the lowest, or drain-off, points, the material which normally would gather as "tears," there continues to drain off until all excess is removed.

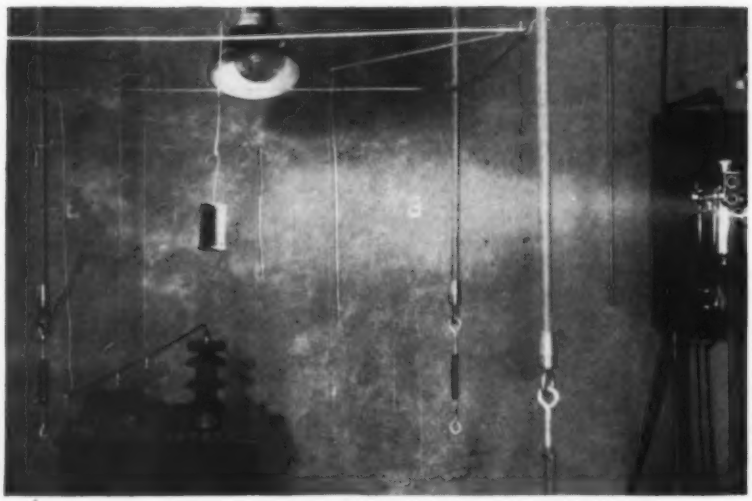


Fig. A
In usual spray painting the spray from the gun reaches only one side of a cylindrical object. To get uniform coating, the object must be rotated or the operator must move around the object.

Problem of Paint Waste

Although there are many items which can be most easily and most satisfactorily finished by spray-coating, this method is generally rather costly of materials. This is due to the fact that there always is a minor or a major amount of "overspray." Under normal procedure, there is little chance of eliminating this overspray and consequent wastage of the finishing material because of the spray pattern. Unless a considerable amount of costly hand manipulation of the spray gun is done, it is impossible to lay the proper amount of finishing material along the edges of the item without having a large proportion of the material carried past. And, if hand spraying is done, there is always the danger that the operator will unintentionally build up too heavy a coating in some areas, while neglecting to give sufficient coverage to others. Such inequalities of coverage are eliminated and overspray is reduced to a minimum by the electrostatic spray method.

Electrostatic Force Guides Paint

As in other types of continuous spray-coating, the items to be finished are carried past the spray gun by any suitable conveyor. When the item enters the spray position it passes into an electrostatic field. To create this field, a series of insulated electrodes made of fine copper are set up as a grid at a fixed distance from the object being coated. A high-voltage electrostatic charge applied to these wires creates a strong field of attraction between the grid and the work which is grounded through the conveyor. As the finely atomized particles of the finishing material are sprayed into this field, they are carried by the electrostatic force and deposited upon the item.

Because of this electrostatic force, spray particles which normally would pass by the work to the exhaust system are deflected in their course and directed onto the work. Air pressures used in electrostatic spraying are extremely low, around fifteen pounds, and the electrostatic force is sufficient to *reverse* the direction of most of the paint particles. To insure uniformity of the finish, cylindrical pieces are rotated as they pass the spray position, and thus, with a spray gun at only one side of the spray booth it is possible to coat both sides of the work. Flat sheets or large pieces which do not lend themselves to rotation are carried straight through the spray zone and may be coated on both sides simultaneously by locating spray guns at each side.

Effect of Shape of Object

It should be noted also that the uniformity of the coating depends upon the shape of the item being finished. Since protruding and projecting surfaces exhibit a somewhat greater attraction, and also because they obstruct the flow of material, they tend to receive a heavier deposit of the finish than do the recessed surfaces. The difference in the amounts of material reaching protruding and recessed surfaces varies with the extent to which the latter are shielded from the electrostatic force by the former.

An excellent example of how the electrostatic principle works is shown in the accompanying illustrations (Figs. A and B). In the first of these, a cylindrical object, supported in front of stationary spray gun, receives the coating only on the side facing the gun. Part of the coating material goes past the object and is lost. In the second of these photographs, a similar object also is suspended in a stationary position. This time, however, the hook is grounded and a series of fine wires surrounding the article are charged with a high-voltage current. Spray from the gun, passing behind the object, is met by the strong electrostatic force and directed back and deposited on the article. Thus, the item is completely coated although neither its position or the direction of the spray has been changed. As has been mentioned before, however, this is not the recommended practice and some provision usually is made for rotating the work as it passes the spray position as a means of insuring the utmost uniformity of the spray-coating.

Equipment Must Be Tailored

Although the operation of electrostatic spray-coating equipment is safe, automatic and efficient, the setting up of the equipment requires considerable study and engineering. In other words, the equipment must be tailored to each particular installation so that the proper distances are maintained between the grid and the object being finished. In this way, the electrostatic-spray process can be adapted to most items, the production of which justifies automatic finishing.

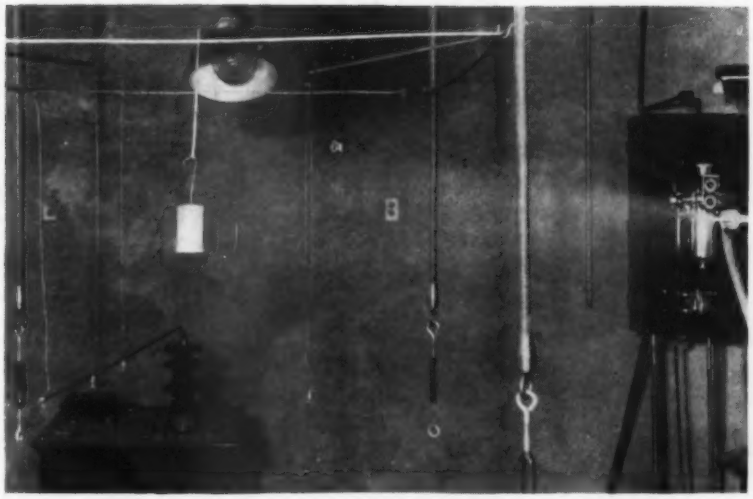


Fig. B
When an object is suspended in an electrostatic field, all sides of the object are coated uniformly from one spray gun without moving the gun. There is no paint waste and time is reduced.

Most any type of conveyor system can be used to carry the parts past the spray gun and, consequently, conveyor systems already in use are usually satisfactory. If, however, the product is roughly cylindrical in shape, the conveyor should provide for two or three rotations per foot of forward travel through the spray position. Depending upon the size and shape of the item, conveyor speeds can range from 3 to 80 feet per minute.

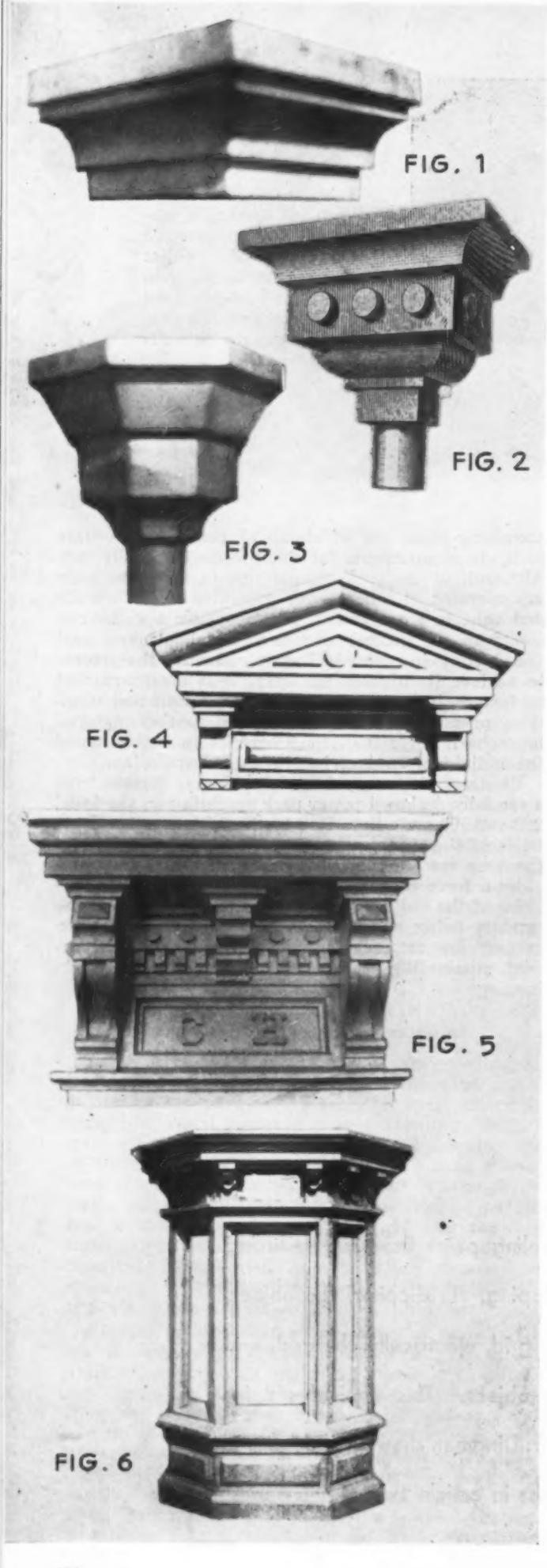
Most Paints Can Be Used

Any finishing material which can be successfully atomized can be applied by the electrostatic method. With slight adjustments in solvent balance, enamels, lacquers, oils, or water soluble materials can be handled with ease. It should also be noted that it is not necessary that the item being coated be an electric current conductor in order for it to be electrostatically sprayed. Even such nonconducting material as pottery can be successfully spray-coated by this method.

Inasmuch as the spray guns are operated at fluid pressures of about 75 ounces per square inch and at atomizing pressures of about 15 pounds per square inch, air requirements for this process are easily met. Although of the conventional remote type, the guns are operated at much lower pressures than normally and this, to some extent, is responsible for the efficiency of the process as less material is blown past the object being coated. But, in order for the process to achieve its highest efficiency, it is necessary that all factors, including electrode spacing, fluid and atomizing pressures, conveyor speed and coating material be properly correlated. Such correlation is the aim of the individual engineering of each installation.

Electrostatic energy for this process is derived from a specially designed power pack operating on the usual 220-volt, 60-cycle line. Due to the inherent characteristics of the transformer, it produces 100,000 volts at the very low current of 10 milliamperes. This provides a force sufficiently strong to insure that all particles of the finishing material will be attracted to the product being sprayed. At the same time, the extremely low amperage provides a relatively safe current, eliminating any element of danger to the workmen.

The electrostatic principle of controling paint flow and reducing waste is also applicable to paint dipping. In dipping, the object, after dipping, is suspended above a grid, electrically charged, and all surplus paint is "pulled" off the object. This eliminates paint "tears" and heavy concentrations. Mr. Dingman shows and describes the electrostatic "de-tearing" process in article two of this series.



Pictorial Instruction Course for Sheet Metal Training

By William Neubecker

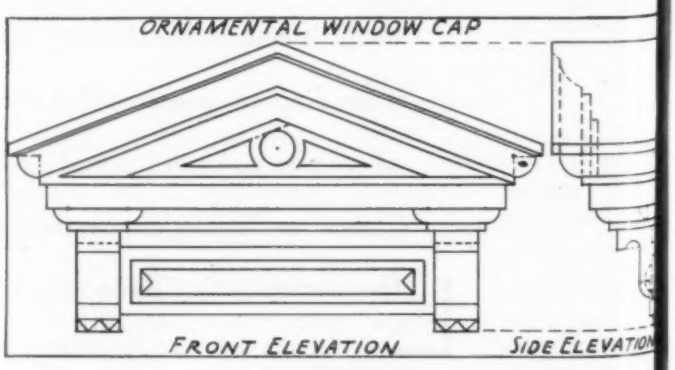
THE eighteen photographs covering architectural sheet metal work and the twenty-five illustrations article, do not cover the full courses given in the class covering fittings for heat, ventilating, air conditioning and industrial sheet metal work, shown with this room of the New York Trade School (oldest sheet metal trade school in the country), but these illustrations do represent the full course in general. These illustrated subjects are recommended for sheet metal apprenticeship training; from them selections can be made which will be most appropriate to the line of trade or teaching.

In addition to the sheet metal courses given in the school, a pattern drafting course to cover sheet metal work in all its branches is given. Two hundred and thirty five exercises are given in the text book especially prepared by the writer for class room use. In arranging this pattern course of study heed has been given to the selection of problems of practical utility.

Outline of Courses

At first the students receive instructions in the cutting of curves and circles; in soldering flat and upright seams; grooved and riveted seams; and in drawing simple geometrical problems. These instructions furnish practice in the proper use of the "snips," the soldering iron, the groover, rivet set, and the drawing instruments. After this preliminary training the student is ready to continue the course in which he enrolled, either architectural, heating, ventilating, air conditioning or pattern drafting.

Whichever course is taken, blue prints have been prepared, drawn to a 3 inch scale, similar to a reduced reproduction of an Ornamental Window Cap shown herewith. From these blue prints, the student learns how to draw the full size detail on the drawing board, develop the pattern shape, transfer it to the sheet metal, cut it and form it on the brake, roller or other tools. It is then assembled either by soldering, seaming, Pittsburgh lock or riveting, whatever the type subject may be, as indicated by the photographs and perspective illustrations shown herewith, which, how-



ever, do not show the complete four courses above mentioned.

Students are advanced as rapidly as their proficiency will permit. When a student shows that he understands an exercise and can lay out the patterns readily and construct the work properly, he is advanced to the next exercise. During the full course, the student will lay out the work (partly shown in this pictorial course) and by doing so he will acquire a thorough grounding in the use of all sheet metal working tools, material and methods.

Now referring to the pictorial column, Fig. 1 shows a moulded gutter with flat heads and a right angled miter joint, this being the first exercise in architectural sheet metal work. This exercise as well as those following up to Fig. 11 inclusive, will be developed by the parallel line method. After the patterns are laid out and have been cut as previously described, instructions are given how to use the brake and formers in bending up the work, and where to start to make the first bend. After the forming operations, the work is assembled at the bench by soldering.

Fig. 2 shows a square moulded leader head with round tube. The raised discs shown are the circles which were cut showing the use of the "snips" and which were stripped with one half inch strips cut on the "squaring shears."

Fig. 3 shows a moulded octagonal leader head with round tube. While this problem is also developed by parallel lines, a plan view showing the octagonal shape must be drawn from which the miter line is obtained, before the patterns can be developed.

Fig. 4 shows an ornamental window cap or lintel with pediment, panels and brackets. This piece of work gives the student practice in detailing from the reduced scale drawing previously described. In this case the pediment moulding must be "raked," that is, a change of profile will occur so that a miter joint can be made with the horizontal return mouldings. Great care must be taken to follow the various profiles when forming in the brake. When properly done, it makes a fine piece of work requiring quite some skill and patience on the part of the student.

Fig. 5 shows an ornamental cornice with brackets, modillion, dentils and panal. This piece of work gives full practice in detailing, developing, forming and assembling. The block letters C-H are the initials of the student who did the job.

Fig. 6 shows a bay window usually made of 20 oz. cold rolled copper on angle iron framing. This makes a fire proof job, does not need any painting and does away with expensive stone work. It gives practice in pattern cutting, such as face miters, angle miters, mullion intersections and raised panels.

Fig. 7 shows a hexagonal ventilator on a pitched roof. The hollow punch is used to cut the semi-circles in the hood.

Fig. 8 shows a dormer window for a pitched or mansard roof. The open space in the dormer is to receive stationary or movable louvres for ventilating purposes.

Fig. 9 shows a movable louvre frame to be built in the wall to ventilate cellars and basements, usually made of 20 oz. cold rolled copper.

Fig. 10 shows a hipped skylight with ridge ventilator and stationary or movable louvres for ventilating buildings.

Fig. 11 shows a hipped skylight with movable turret sashes operated by worm gearings, with gutter around the base of the skylight and leader at each corner to drain the rain water to the roof.

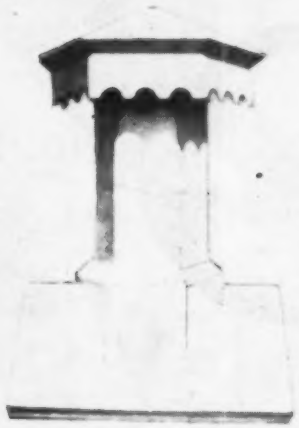


FIG. 7

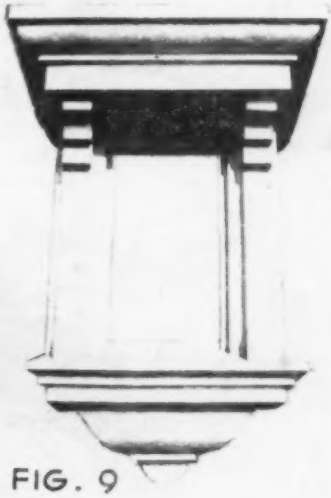


FIG. 8

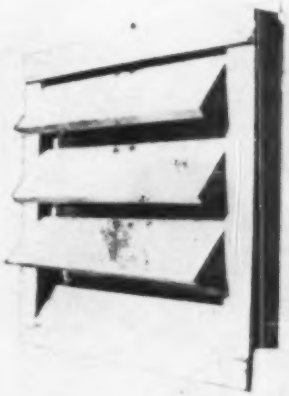


FIG. 9

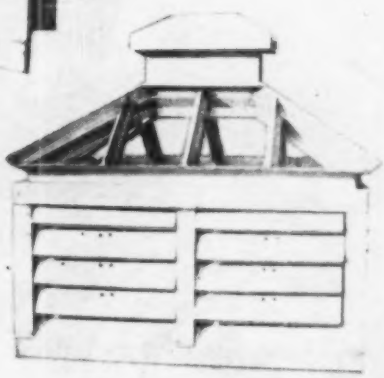


FIG. 10

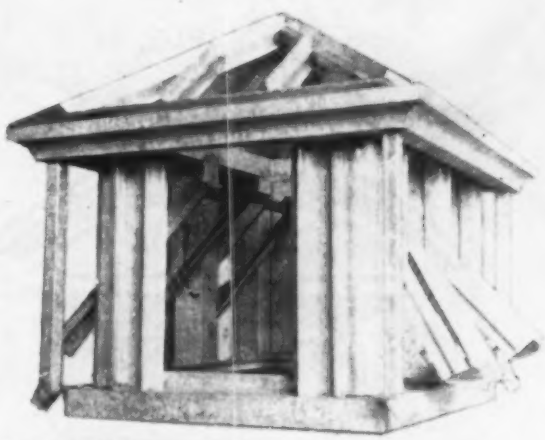


FIG. 11

FIG. 12

FIG. 13

FIG. 14

FIG. 15

FIG. 16

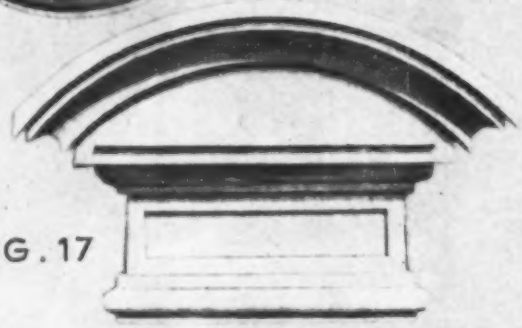


FIG. 17

The following four illustrations cover part of the hand hammer work made by the students, who were interested in this type of work. In laying out the patterns for the following three types, the radial line method is used. Fig. 12 shows a center piece for a metal ceiling. Both the inner and outer quarter round moulds are "raised" on a lead block in which the formation of the mould is made with the raising hammer. The two patterns are laid out in the form of a flaring strip in one piece and the seam is riveted. It requires some little skill to produce a true circle. The star in the center is laid out by triangulation.

Fig. 13 shows a round finial over a conical tower roof. Note the seam lines in the illustration. This type of work requires "stretching" using the flanging hammer on the blow horn stake. Five sections are used to complete the curve which follows the pitch of the tower roof. The seams of these five sections, which are in the forms of frustums of right cones, are riveted and sweated with solder. Care must be taken in stretching that each section will have the proper curvature so that a graceful curve will result when the sections are soldered together as shown in the illustration.

Fig. 14 gives good practice in "raising" and "stretching." The upper sphere is "raised" and made up in six sections; the four middle sections are frustums of right cones and the upper and lower sections are discs of the required size. The bead is "raised," made up in two sections and the lower mould is also "raised." The concave mould in the center is made up in three sections as shown by the seams and is "stretched" to form the desired curve.

Fig. 15 shows a "shell" in the form of a fluted leaf with scrolls. This is not part of the course given in the school, but some students are anxious to know how to do this type of hammer work, and for that reason some special problems are taken up. The work was done with a "raising" hammer on the square head stake. The base has two square miters.

The following three illustrations show part of the machine hammer work done in the school. Fig. 16 shows a large ceiling center piece used on metal ceiling work.

Fig. 17 shows a circular pediment over a pilaster. Fig. 18 (page 232) shows specimens of students' work done in the school and shows what progress the students can make when they are interested, are anxious to learn and full of enthusiasm.

As previously stated the patterns for curved mouldings are obtained by using the radial line method. Whatever profile the curved moulding may have it must be "averaged," by drawing a radial line through the profile, so as to average the inequalities of the mould, required to be made. Four dies are required in operating the power hammer; one female die for the hammer and three male dies for the base. The center male die is stationary, but those on either side of the stationary die are set at an angle. The rule to be observed in setting the side male dies is as follows: Set the side dies at such an angle that lines drawn through the center, would intersect at a point distant, equal to the radius of the pattern; in other words, if the radius by which the pattern is struck is four feet, then the two side dies must be set at such an angle that lines drawn through the center of the dies would intersect at a point four feet distant.

In the many machine made curved moulding exercises not shown here, the students get full shop practice in setting the dies for curved mouldings, having full circles and segments of circles.

Heating, Ventilating, Sheet Metal Work

The twenty five illustrations shown in the two adjoining columns cover SOME of the various types of fittings made in the class room. There are no two alike. These various transitions are recommended, from which selections can be made, to suit the type of instructions to be given to the students. In constructing the various fittings, it is the general practice to use up to No. 24 gauge sheet metal for peening, seaming and Pittsburgh locks. Heavier gauge than No. 24 should be riveted or welded.

Illustration 1 shows a four-pieced, 90-degree peened elbow. The patterns are developed by the parallel line method. When the elbows are constructed from heavy gauge metal, the miter joints are riveted, always being careful to maintain the desired inside diameter and make allowance for the thickness of the metal for the overlapping joint at the slipover end.

2—Shows a right angular tee joint round to round, also solved by the parallel line method. This problem gives the student some practice in using the flanging hammer.

3—Shows a Y branch solved by the parallel line method, the three diameters are equal, with peened miter joints.

4—Shows a four-pieced, 90-degree tapering elbow with peened miter joints. This type of elbow requires the radial line method in developing the pattern shapes and can be cut from *the frustum of a right cone without any waste.*

5—Shows a compound double curved fitting, level at the bottom, the rectangular opening at the left being in a vertical position, but curving downward at the right in a horizontal position. This fitting is flanged and riveted as shown and is developed by the parallel line method.

6—Shows a transition offset rectangular to square with corners double seamed, using not heavier than No. 24 gauge sheet metal. The pattern shapes are developed by the parallel line method.

7—Shows a view of a one-piece, compound curved elbow, rectangular to rectangular. The corners are flanged and riveted. It is developed by the parallel line method, which can also be used when the transition is rectangular to square.

8—Shows a double-curved transitional offset rectangular to square. The corners are flanged and riveted. The patterns are laid out using the parallel line method.

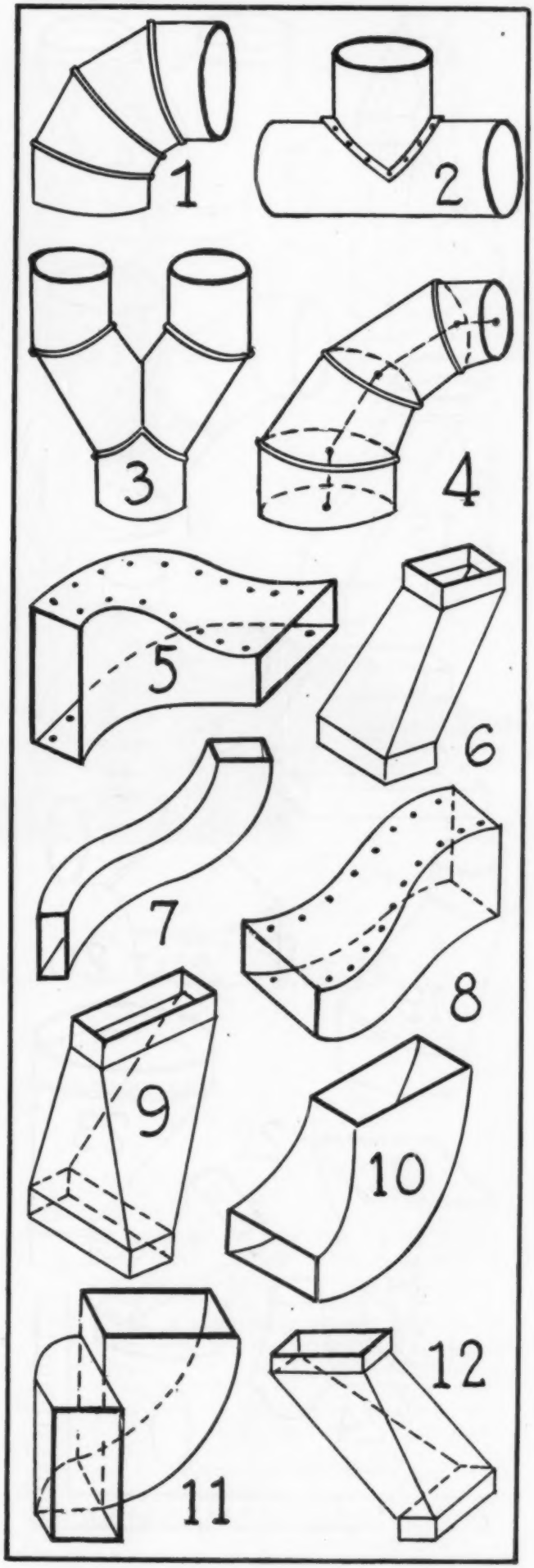
9—Shows a perspective view of an offset rectangular to rectangular, reversed centrally. The corners are double seamed when using not heavier than No. 24 gauge sheet metal. Development by the parallel line method.

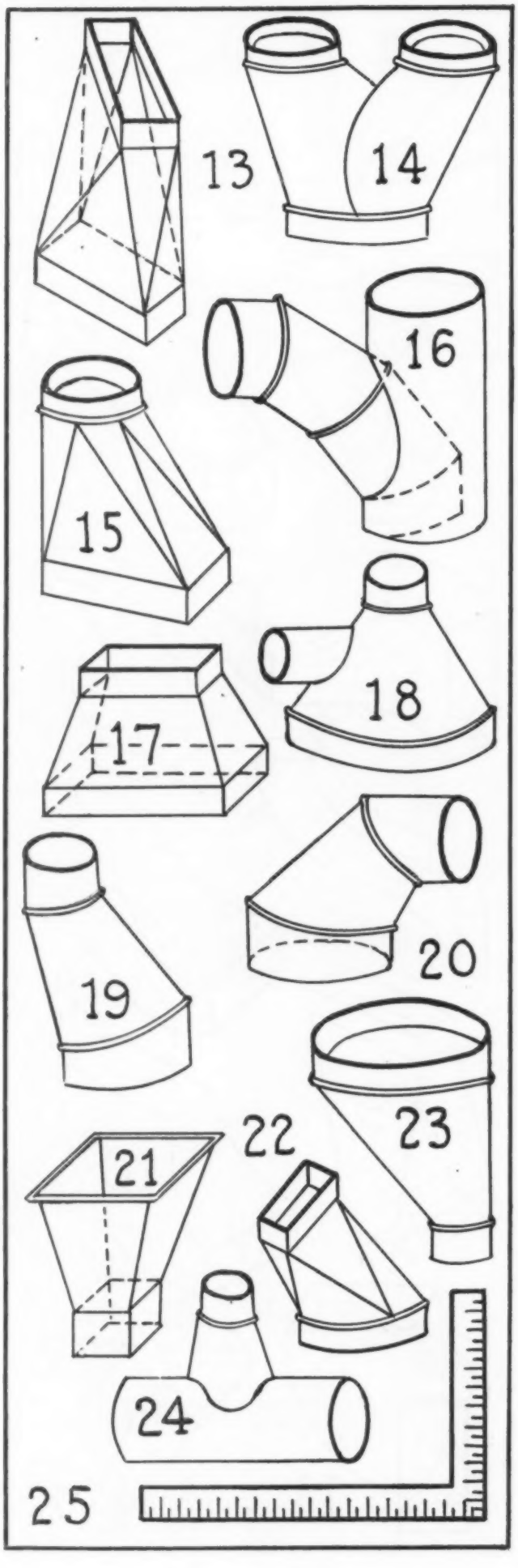
10—Shows a round transitional elbow, rectangular to rectangular in a reversed position. Elbows of this type can be constructed by using the Pittsburgh lock.

11—Shows a perspective view of a "short turn transition rectangular to rectangular." Note that no pattern developments are required for this fitting.

12—Is a double offset for rectangular ducts, when the lower duct in passing up has to lean over and at the same time reverse its position as the illustration indicates. The corners are double seamed and patterns developed by the parallel line method.

13—Shows a TWISTED offset, rectangular to rectangular. As the sides of the duct sections are not parallel to each other, triangulation is required in





developing the pattern shapes. The principles involved are applicable to any twist, whether rectangular to rectangular or rectangular to square.

14—Shows a perspective view of a breeching with oval branches to round, which can be solved by the simplified triangulation method. The perspective shows a curved joint line between the two branches because the view was taken from the right side. This joint line is really a straight line, when developing the pattern shape by the simplified method in triangulation. The main and branch collars are peened as shown.

15—Shows a transition offset rectangular to round, perpendicular at one end as shown. This fitting requires simplified triangulation for its solution. The collar at the rectangular base is added direct on to the pattern. The round collar at the top is peened to the offset as shown.

16—Shows the intersection between a four-pieced, peened elbow and round duct. This fitting is solved by the parallel line method. Before the patterns can be developed, it will be necessary to find the joint or intersecting line between the elbow and duct, by means of projection points obtained from the plan. The principles involved are applicable to any size elbow, having any number of pieces, regardless of whether the elbow intersects square, rectangular or round ducts.

17—Shows a reducer for rectangular ducts. The collar connections are allowed directly on to the pattern shapes, which are developed by the parallel line method.

18—Shows the intersection between the frustum of a cone and cylinder placed horizontally. This fitting requires both parallel and radial line methods in developing the pattern shapes.

19—Shows a tapering offset round to round and is solved by the parallel line and simplified triangulation methods. The upper and lower branches are peened to the taper piece as shown.

20—Shows a three pieced tapering elbow round to round also solved by the parallel line and simplified triangulation methods. The upper and lower branches are peened to the taper piece as shown.

21—Shows a grain hopper square to square, with heavy wired edges around the inlet. This type is solved by the parallel line method.

22—Shows an offset round to rectangular solved by the simplified triangulation method. The collar at the round end is peened, and the rectangular collar is added to the triangulated patterns as shown.

23—Shows a conical hopper oval to round straight on one side, which can be solved by the simplified method in triangulation. Both upper and lower collars are peened as shown.

24—Shows a conical or tapering branch intersecting a cylinder. This type requires both parallel and radial line methods in developing the pattern shapes. Before the patterns can be developed it will be necessary to find the joint or intersecting line between the cone branch and cylinder by means of projection points obtained from an end view. The round collar is peened to the taper branch as shown.

25—Shows the steel square. No tool in the equipment of the shop merits more careful study than the steel square. The apprentices should be instructed not to fail to appreciate that the steel square is not merely an instrument for taking measurement and squaring up work, but is a LIGHTNING CALCULATOR. By

(*Continued on page 163*)

Fig. 1 — To make a one-piece die, a hole is first drilled in the plate, then the saw blade is put through and welded and the die plate is cut along the line of the pattern allowing a hair of metal for final smoothing.

"Pancake" Dies Save Time*

By Eugene E. James

Manufacturing Research, Lockheed Aircraft Corp.,
Burbank, Calif.

NEW tools and parts often had to be made on the spur of the moment, in the late fast-moving war of production. With the number of airplane parts running literally into thousands, and with improvements continually being made in aircraft design, our type "D" or "Pan Cake" dies have produced tools and blanked and pierced aircraft parts in approximately one-third the time required by the conventional die method. As a result, curt statements like this often came from the part expeditors at Lockheed: *"Part number so and so—300 must be on the assembly line in twelve hours—there are no tools available—dies therefore must be ready in ten hours."*

The type "D" die made it generally possible to meet rush orders like the one given above. The value of this die in keeping delays out of the assembly line at Lockheed was inestimable. With a wide range of Pompton tool steel strip, .85-.95 carbon, sizes ¼" to ½" thick, by 6" to 23" wide, by 96" long to choose from for the die surface, plus the technique of cutting this steel on the Doall saw and then flame-hardening the edges with an acetylene torch to definite hardnesses and depths of hardness, the fast resultant tool completion materially helped the assembly lines to keep up plane production schedules.

Moreover, our development and use of type "D" dies have resulted in the saving of thousands of man-hours, to say nothing of the material and consequent money savings. The direct costs of building a "D" die are nominal, often running as low as $10.00. As

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model changes take place, making the die obsolete, the steel is salvaged and may be used over again for various other tools, such as open-end wrenches and bucking bars, or for smaller dies.

Aircraft materials stamped in this manner include heat treated Dural, high tensile stainless steel in the half hard condition, and SAE 4130 strip. If the finished part as shown in the engineering drawing is flat, the template maker scribes a duplicate layout on a sheet of flat steel template stock. If the part is formed on a straight brake line, the template maker will compute the size of the flat blank. If the brake line is curved, the blank generally has to be developed.

How Dies Are Formed

The method used in making the die where the steel is all in one piece, is first to drill a hole in the plate, then run the saw blade through the hole, weld both ends of the blade together and grind the weld smooth. The welding and grinding units are auxiliary attachments of the Doall saw and are mounted to the frame of the machine. The correct cutting speed is then determined by a speed selector chart and the operator makes the cut. (Fig.1).

In flame-hardening, (Fig. 2) the steel is placed in a tank containing water with the edge of the steel generally one-eighth inch above the surface of the water, depending upon the outline of the part. The metal is heated by an acetylene torch until the steel becomes red, while the operator guides the torch around the periphery of the part with the flame directed at the tool's cutting edge.

Thin Die Sections Permissible

This type of heat treating is relatively fast, for an operator flame-hardens approximately six inches per minute. Other savings are manifested in the small amount of die material required—accomplished by using thin sections of tool steel. It is important to remember in the design of "D" dies that flame-hardening keeps distortions to a minimum; therefore, thin die sections are practical from the viewpoint of heat treating. Approximately one-eighth inch hardness penetration, Rockwell 58—60 on the "C" scale, were discerned in recent photomicrographs. This depth of penetration makes flame-hardening practical on long-run production. Dies with flame-hardened edges have produced as many as 100,000 parts of the thinner aluminum alloy parts. Flame-hardening does not cause decarbonization, so grinding in some instances is lessened.

Fig. 2—To flame harden the die cutting edge, the die plate is immersed in a pan of water leaving about ⅛-inch exposed. The metal is then heated red hot with an acetylene torch. Such a hardened die will cut as many as 100,000 aluminum pieces.

On parts where the outline is square, rectangular or round, the punch and die are usually machined to the correct dimensions. On irregularly outlined parts, the general practice is to machine the punch to the template—allowing for punch and die clearance—and

Fig. 3—A stripper piece (may be either rubber or cork) is cemented to the backing-up die. This stripper serves as a cushion and also as a spring to throw off the stripped metal in complex dies.

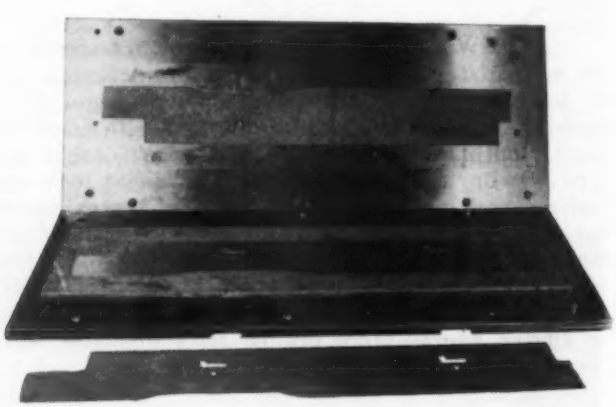


Fig. 4—A typical "Type B" die with cork stripper (press fitted without cement) and, below, a die cut piece of stainless steel.

then mount the punch and die in the die set, the punch having been hardened, the die left soft. In preparing the die for the shearing-in operation, 1/32″ on a side is generally allowed for finishing. The die is usually sheared approximately 1/32″ deep by the punch, then finish-machined and filed to suit the set punch and die clearance. The die is then flame-hardened and the tool is ready for assembly and production.

The type "D" die is assembled by press-fitting rivets into the punch and die steels through their respective backing-up plates. A standard riveting machine is generally used.

Dowels Align Dies

For maintaining the exact location between the cutting steels and the backing-up plates, standard dowel pins are generally used. Some toolmakers, where the die steel is in one piece and crosswise thrusts are balanced, use special machined rivets for both fastening and locating purposes. However, the use of standard dowel pins is generally recommended for locating purposes, since their shear strength is considerably higher than the rivets, which are made out of a low-carbon steel and left soft.

A cork stripper is generally used on the type "D" die for stripping the part out of the die, and the strip stock skeleton off the punch, on aircraft materials under 1/16″ thick. However, in dies where the stripping condition is severe due to a grouping of piercing punches, such as may occur in compound dies, or where the outline of the part requires additional stripping pressure, rubber is used in place of the cork regardless of the thickness of material.

Cork or Rubber Strippers

Figure 3 shows the installing of a rubber stripper. Figure 4 pictures a "D" die used in the blanking and piercing of a stainless steel aircraft part. The cork stripper shown in this illustration is press-fitted into the die and around the punch from a rectangular piece of cork; this is accomplished in one operation. No cement is used to retain the cork; consequently, it can be removed and used on other jobs should the die become obsolete.

The type of steel to use for the punch and die in the general run of "D" dies is .85-.95 carbon tool steel strip; drill rod is used for the round piercing punches, hot rolled steel for back-up plates and cold drawn steel for rivets.

A die maker in some companies may make type "D" dies, although on the average run of work it is not necessary to use a man of this calibre. The more common practice is to put a toolmaker in charge of a group and let him train and supervise apprentice toolmakers. Another method sometimes used is a production line where each worker is highly specialized on one or several operations.

The importance of conserving aircraft materials caused Lockheed to place extra stress on stock run layouts for all stampings. Thus, tool design drawings are made on type "D" dies, by a tool designer who is a specialist on stock runs. He merely makes a stock run layout on tracing paper which already has printed on it most of the correct die detail and procedure. Tool design time with this method is only about an hour for the average "D" die. Operation with these dies adds up to a model of speed, economy and efficiency.

Neubecker-Pictorial of Sheet Metal Training

(*Continued from page 160*)

its aid many calculations are obtained almost INSTANTANEOUSLY. In a subsequent article the writer will explain how calculations can be made with the steel square for finding the unknown areas for trunk lines of either round, square or rectangular ducts, thus saving laborious calculations. This is based on the geometrical theorem, that the square of the hypotenuse of a right angle triangle is equal to the sum of the squares of the base and altitude.

Definition of Triangulation

In reference to the advice given in the above demonstrations on the use of the simplified method in triangulation it may be proper to give, at this time, the definition of the method, which follows: When the fittings are symmetrical, that is, when both halves are similar and have but one offset when viewed in elevation, then the simplified method can be used; but when the fittings have offsets both in plan and elevation, the long method of triangulation must be employed, using both *plan and elevation* in the development of the pattern shapes, while in the simplified method use only the ELEVATION AND THE HALF SECTION AT EITHER END in developing the pattern shape.

Fig. 18—The four round columns, the round pedestal and the ornamental vase represent hand hammer work. The circular arches and segmental pediments are made on the power hammer.

Getting the Most Out of Your Press Brake

1001 Standard and Special Bending, Forming, Flanging, Punching Operations Your Press Brake Can Perform

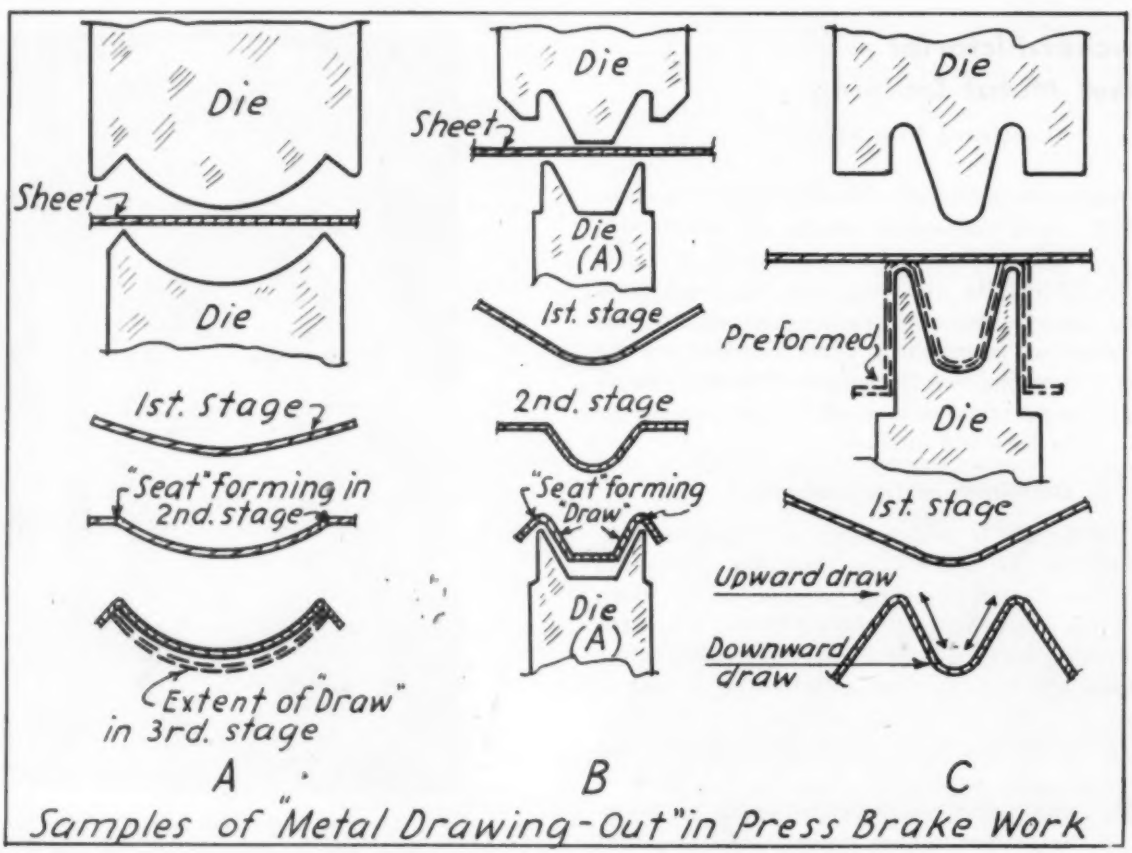
By Ernest E. Zideck
Sheet Metal Consulting Engineer

Pressures Required To Form Air Bends, Congested Bends, Compressed Bends

IN Press brake forming of sheet metal, the *thickness* of the sheet has *less* influence on pressure requirements or brake capacity than has the *nature of the bend.* In Figures 1 to 10 of the accompanying drawings are given approximate pressure requirements, in tons, for making air-bends, congested bends, and compressed bends; while in Figures 11 to 14, and more so under the Figures A, B, C, below, are illustrated formatures in which the metal is partly compressed and partly drawn-out.

Air-bends are those made in dies where only the point of the male die and the uppermost portions of the working area of the female die contact the metal. These bends are commonly made in the "V" type of female dies, the degree of the bend being governed by the depth of the descent of the male die.

Congested bends are bends on a common inside radius (the thickness of the metal worked), where



Three types of bending in which the metal formed is prevented from freely "flowing" by the several "seats" which compress the metal at the die points.

the sheet is congested by the male die between the walls of the "gap" in the female die and into its bottom part.

Compressed bends are made on an inside radius ½, ⅓, or less of the thickness of metal worked, and in this bend the metal is tightly "wrapped" about the point of the male die, the small inside radius causing the metal's compression to the shape of the point of the die.

In all three of the foregoing kinds of bends there is a free flow of the metal into the gap in the female die, the flow being only partly obstructed by the sharp edges of the working area of the female die over which the metal is moved in its downward travel.

Under A, B, C, are shown stages in the process of sheet metal forming, where the so-fashioned dies prevent the flow of metal from its edges. From this stage on drawing-out of the metal already in the dies takes place. From here on, the forming process may be called stamping (rather than bending).

Under "A" we see that in the second stage of the forming process the metal is bent down over the protruding edges of the female die. This bending hardens the metal in the area of the bend, and as this hardened area will not flatten easily, "seats" are formed in the area, which will hold the metal stationary upon the sharp points of the die and prevent its flow into the radial portion of the die. In the third stage of the forming process, with the seats that much more secure, the metal must expand to reach to the bottom of the die.

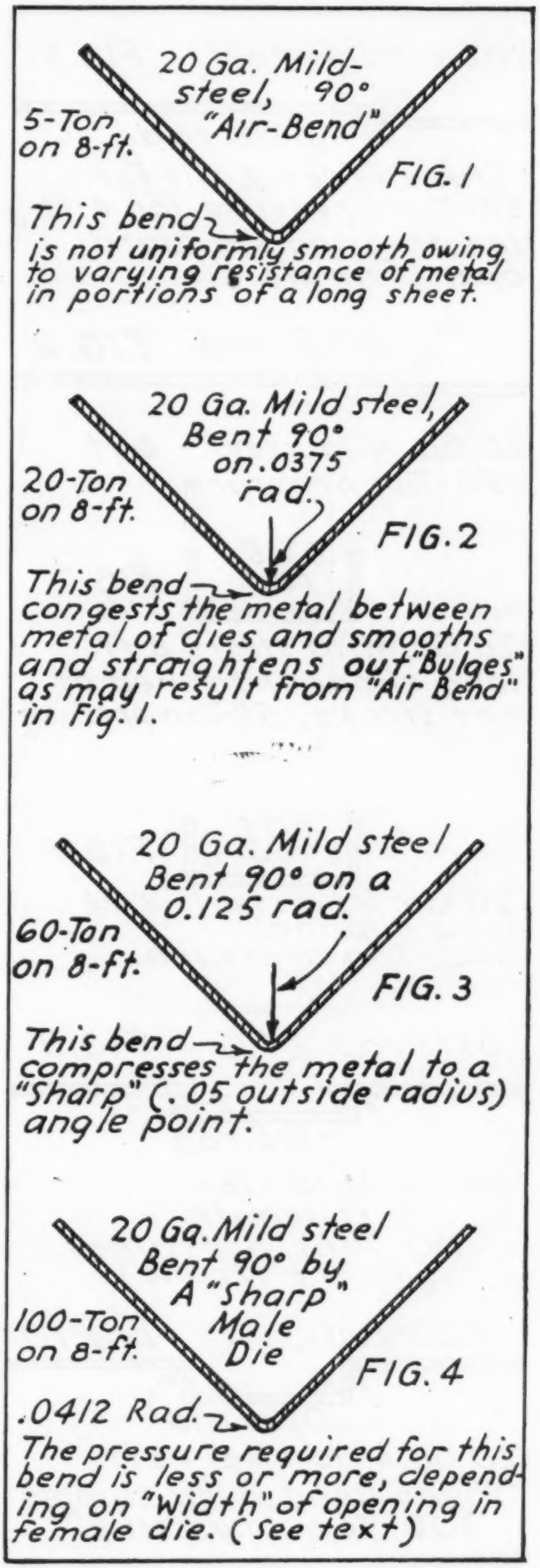
Still more pronounced seat forming is shown under "B", and the drawing-out of the metal to the bottom of the die is considerable.

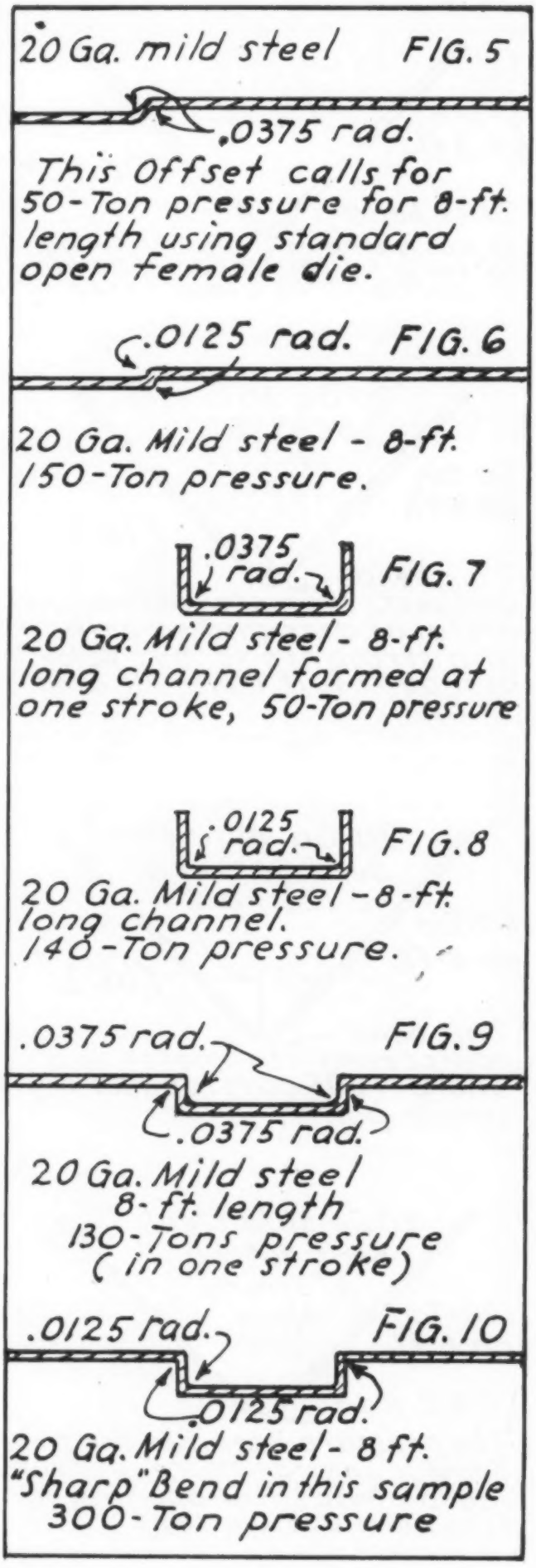
Double drawing-out of the metal is shown under "C", where the draw is both downward to the bottom of the die, and into the cavities in the male die. Large tonnage-capacity brakes are needed in this multiple, one-stroke forming, and if there is no brake of sufficient capacity available for this kind of work it is better not to attempt it, but do the work bend-by-bend, the smaller radials first, and the larger radial last.

Pressures Required for Bends

In considering the air-bend shown in Fig. 1, and also the bends in Figures 2, 3, 4, the pressures required for these bends vary and are to a great extent governed by the opening in the female die employed in the work. To illustrate: if we lay a sheet of 20 gauge metal, 30 inches wide, over two bars supporting the sheet at its edges, the sheet will by its own weight bend down in the middle. If we press the sheet down with a finger, it will bend still more. But if we move the bars 10 inches apart, it would require the pressure of several men's hands to bend the sheet slightly downward. And if we move the bars close together, leaving only a gap four inches wide between the bars, a dozen men cannot bend the sheet down between the bars.

The same thing applies to the gap in a female die used in press brake work. If the gap is wide the metal will be bent easily by the descending point of the male die. And vice-versa, if the gap in the female die is narrow, much more pressure is required to make the desired bend, be it a 45 degree angle, a 90 degree angle, or an acute angle. Most pressure is needed at the start of the bending operation. Once the seat is formed in the metal by the point of the male die striking, the downward flow of the metal from its edges will be accomplished with half the pressure. Therefore, there is not much pressure-difference in


20 Ga. Mild-steel, 90° "Air-Bend"
5-Ton on 8-ft.
FIG. 1
This bend is not uniformly smooth owing to varying resistance of metal in portions of a long sheet.
20 Ga. Mild steel, Bent 90° on .0375 rad.
20-Ton on 8-ft.
FIG. 2
This bend congests the metal between metal of dies and smooths and straightens out "Bulges" as may result from "Air Bend" in Fig. 1.
20 Ga. Mild steel Bent 90° on a 0.125 rad.
60-Ton on 8-ft.
FIG. 3
This bend compresses the metal to a "Sharp" (.05 outside radius) angle point.
20 Ga. Mild steel Bent 90° by A "Sharp" Male Die
100-Ton on 8-ft.
FIG. 4
.0412 Rad.
The pressure required for this bend is less or more, depending on "Width" of opening in female die. (See text)


20 Ga. mild steel FIG. 5
.0375 rad.
This Offset calls for 50-Ton pressure for 8-ft. length using standard open female die.
.0125 rad. FIG. 6
20 Ga. Mild steel - 8-ft. 150-Ton pressure.
.0375 rad. FIG. 7
20 Ga. Mild steel - 8-ft. long channel formed at one stroke, 50-Ton pressure
.0125 rad. FIG. 8
20 Ga. Mild steel - 8-ft. long channel. 140-Ton pressure.
.0375 rad. FIG. 9
.0375 rad.
20 Ga. Mild steel 8-ft. length 130-Tons pressure (in one stroke)
.0125 rad. FIG. 10
.0125 rad.
20 Ga. Mild steel - 8 ft. "Sharp" Bend in this sample 300-Ton pressure

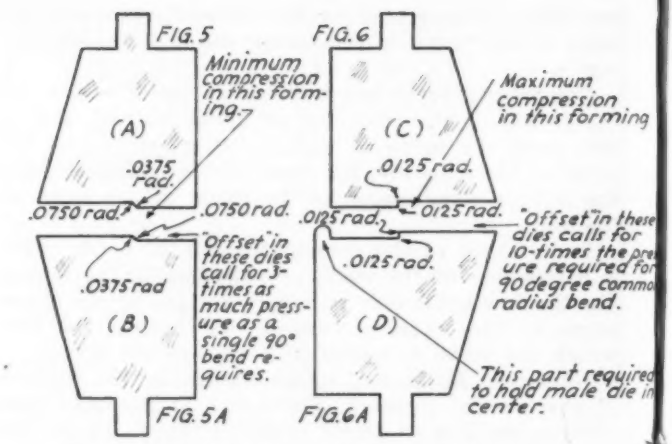


Fig. 5A and 6A, above, show greatly increased pressures required by sharp "offsets."

making a 45 degree angle, a 90 degree angle, or an acute angle.

If we take 20 gauge soft steel, 8 feet long, and bend it as shown in Figure 2, the difference in pressure requirement in narrow and wider gaps in the female die will be somewhat as follows: ¼ inch opening in the die will require 20 ton-pressure; ⅜ inch opening, 13 tons; ½ inch opening, 10 tons; ⅝ inch opening, 8 tons; ¾ inch opening, 7 tons; and 1 inch opening, 5 tons. Thus we see that where we can use the 1 inch opened-die, we can do the work by a 5 ton pressure; that is, only ¼ the pressure required for the bend made in a ¼ inch opened-die.

In comparison with the above, only 7 tons more pressure is required if we work 16 gauge of that same mild steel, 8 feet long. 27 more tons are called for if we work 12 gauge of same length (20 tons for 20 gauge, 47 tons for 12 gauge).

If we make a congested bend, 90 degrees, in a 3/16 plate, we shall need 80 tons pressure. But if we use in these bends a wider opening die (wider than 8 thicknesses of the metal worked), the pressure-requirements will decrease with each ⅛ of an inch added to the "gap" in the die, as above cited. Thus, we can make the congested bend in the 3/16 inch plate at only 60 tons pressure in a 2 inch opening die, and at 48 tons pressure in a 2½ inch opening die. A 90-degree air-bend in the 3/16 material can be done by about 20-ton pressure, provided we use a 2-inch opening die. Each linear inch of sheet metal calls for equal pressure in its bending or forming, and it is obvious that we can use a 60-ton capacity brake even for stamping, if the pieces worked are short.

Tonnage-requirements given with each of the Figures 1 to 10 are based on the use of a female die having a gap eight times as wide as the thickness of the 20 gauge steel. Where we can use "wider" openings in the die, the pressures needed will be less in proportion, as shown above. In a compressed bend having an inside radius only ⅓ of the metal thickness, as in Figure 3, the calculated pressure needed in 20 gauge mild steel, 8 feet long is 60 tons—three times as much as is needed in a congested bend, shown in Figure 2. Inasmuch as these bends will be made in many cases in dies having a lesser opening than eight metal thicknesses, the pressure- requirement will rise, as shown in the preceding text.

An extreme case of a compressed bend is shown in Figure 4, the bend accomplished (in soft steel) by a die-set of which the male die has only a "hair" taken off from its sharp working edge, and of which the

female die has a bottom area accommodating not more than 1⅓ the thickness of the metal. The pressure requirement for this bend increases by 40 tons over that needed for the bend in Figure 3.

"Offset" forming using dies shown in Figures 5A and 6A and making bends as shown in Figures 5 and 6, illustrates best the differences in pressures needed in (a), common radius inside bends, and (b), in compressed bends forming the offset. True, an offset is made to receive and hide the overlapping second piece of metal. The offset shown in Figure 5 would not be satisfactory unless we intend to fill the resulting gap by solder or other means. For a product in which the "lap" is spot-welded (or bolted merely), a sharp offset is desired, and the one in Figure 6 would be chosen.

The same great difference in pressure-requirements is shown in Figures 7 and 8, in channel forming, and while the common-radius bends in Figure 7 can be made at only 50 ton pressure (at one stroke), the "sharp" bends in the channel in Figure 8 will call for almost three-times as much pressure. True, we can form these channels step-by-step, in which case a 20-ton, or a 60-ton pressure would do the work.

A similar example of varying pressure requirements will be seen under the Figures 9 and 10, depicting a 4-angle formation at one stroke of the die. If we maintain the common radius of the metal thickness in these bends, the pressure needed for the work will be about 130 tons in 20 gauge mild steel, 8 feet long. But if we make the formation with only ⅓ the common radius, we shall need near 300 tons pressure.

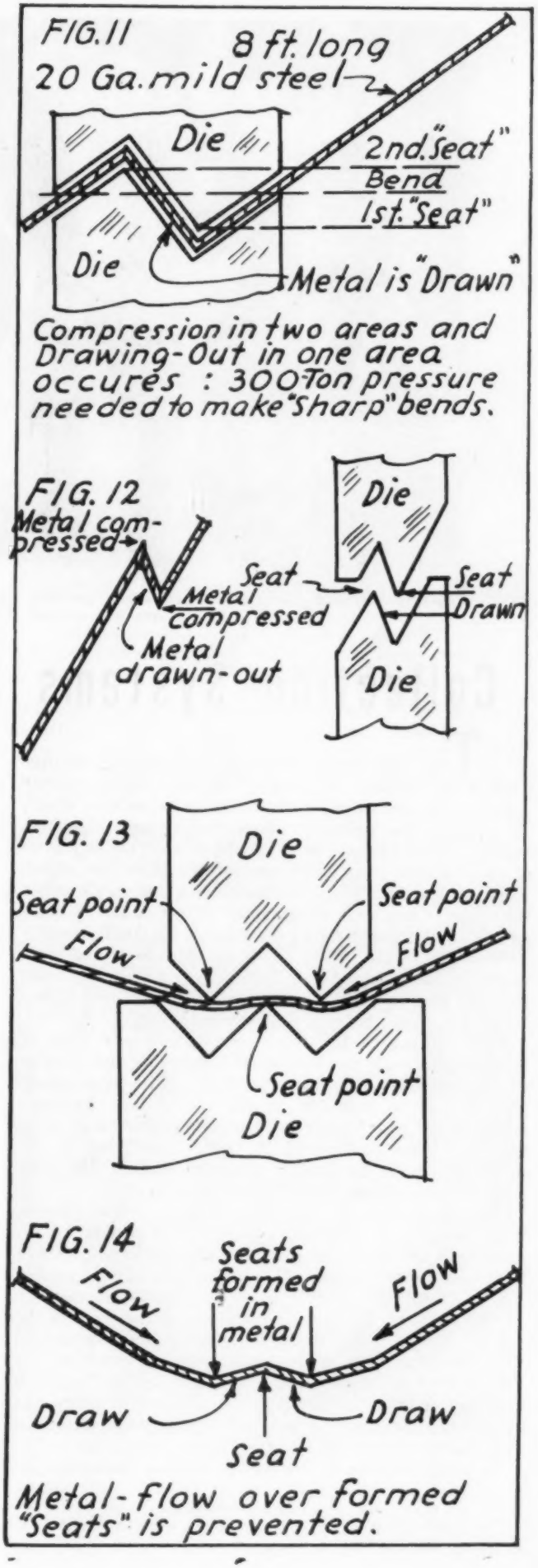
Thus it can be seen that the pressure requirements increase principally with the amount of compression of the metal in the dies, and not so much with the thickness of the metal worked.

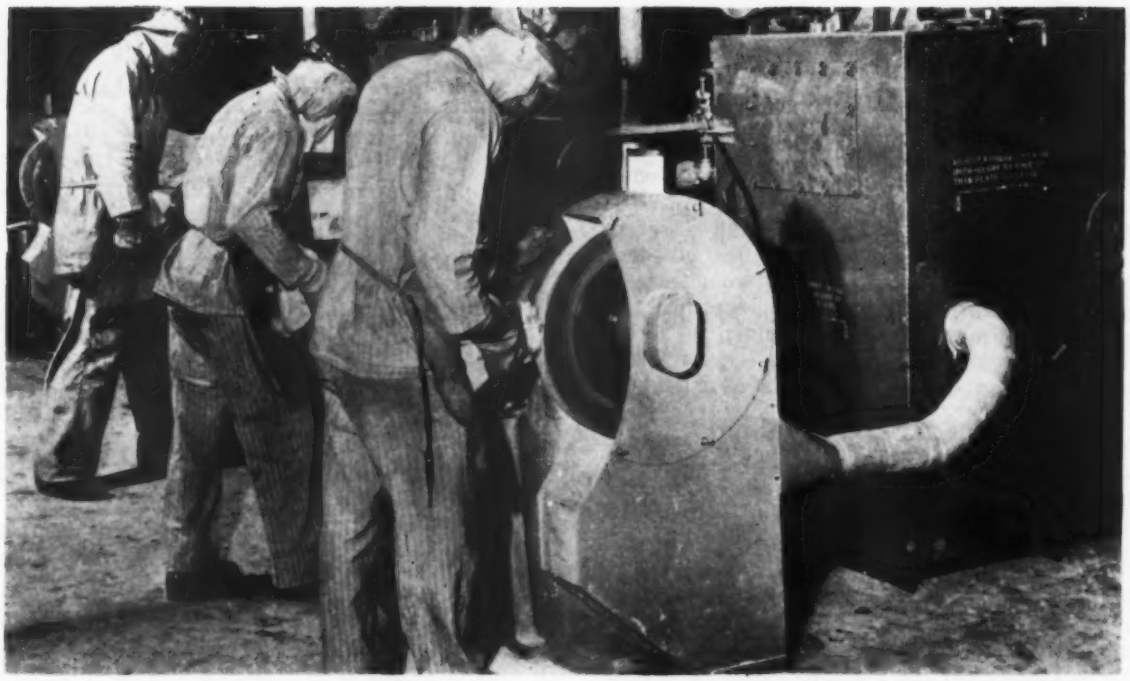
Then, again, when doing the work in the dies fashioned for one-stroke operation, we cannot take advantage of wider openings in the dies, as we can in bends under Figures 1, 2, 3, and 4. We can, by using a narrow female die, make both the formatures shown in Figures 9 and 10, in step-by-step operations, in which case we would need not more than a maximum of 20 tons in Figure 9 bends, and 60 tons pressure in Figure 10 bends.

It should be borne in mind that *any* formature can, by one device or other, be made in a common 60-ton capacity brake, but obviously the work takes much longer and comes out less uniform or smooth than if done in special dies, at one stroke of the press. Even the offsets shown in Figures 5 and 6 can be accomplished in a 60-ton brake if we brake back and forth until we receive a semblance of formation of Figure 5. The offset is then completed by a sharp male die in strips of metal of the same or heavier gauge as the metal worked, spotwelded or otherwise secured together in imitation of the die D in Figure 6A. The so-secured strips are fastened to a *flat* die for operation in their offset portion of the sharp male die.

Figure 11 shows what happens to the metal formed, in one-stroke operation, in dies similar to those discussed under A, B, and C, in that seats are formed in the metal preventing its flow to where it is wanted. In the dies shown, the lowermost seat is formed first, with the second seat formed immediately after. Inasmuch as the points of the dies are sharp, the first bending of the metal occurring over them results in the metal in the seat areas hardening, not flowing past the seats, and the dimension "between-the-seats"

(*Continued on page 230*)





Battery of stand grinders for magnesium grinding using a wet collector connected directly to grinder hood. (All photos courtesy American Air Filter Co., Inc., Louisville, Ky.)

Collection Systems For Stand Grinders*

THE most common method of grinding castings used in the foundry is probably the floor stand grinder with one or two wheels mounted on a horizontal shaft. To protect the operator from the hazard of wheel failure, it has become an established practice to install a wheel guard or a hood around the abrasive wheel. (The American Standards Association Safety Code for the Use, Care and Protection of Abrasive Wheels embodies the engineering standards for such hoods.) This same guard when properly designed and connected to an exhaust ventilation system can be made to serve as an exhaust hood to remove dust and fumes created during the grinding operation.

The opening in the hood on the ordinary type of floor stand should not exceed 90 degrees or one quarter of the periphery. the hood itself should be so designed and located in relation to the wheel that particles released at the grinding point will be projected directly into the lower portion of the hood, travelling in the direction of the air flow established within the enclosure by the exhaust ventilation connection.

The fan action of a rotating abrasive wheel creates a pronounced air current, which, if not properly handled, will create an undesirable air movement. On a floor stand grinder hood, this air motion can be broken up by installing a baffle plate or tongue at the top of the hood to be kept adjusted to within ¼" of the wheel. The bottom edge of the hood opening should also extend out from the wheel to a point where the air current set up by the lower half of the wheel is retained within the hood and is utilized to carry the entrained particles toward the exhaust connection on the hood.

In many instances, owing to special requirements, the shape of a hood may have to be altered to a considerable extent from the conventional standard design. In such cases, it should be borne in mind that the object of a hood is to trap the contaminated air so that the air flow established by the exhaust ventilation will be able to pick up this dust-laden air. The opening should be kept as small as possible in these hoods in order that an effective velocity with a minimum amount of air flow can be maintained.

Various handbooks, codes, state regulations, etc., are available which provide data for the selection of the proper size of exhaust pipe connection on hoods for different diameter grinding wheels.

On the ordinary floor stand grinder, the following table will be of assistance in selecting a pipe size which conforms to present good practices.

Wheel Dia.	Exhaust Connection Pipe Size (Dia.)
Over 9" to 16" incl. not over 2" thick.....	4"
Over 16" to 19" incl. not over 3" thick.....	4½"
Over 19" to 24" incl. not over 4" thick.....	5"
Over 24" to 30" incl. not over 5" thick.....	6"

An average linear velocity between 4500-5000 f.p.m. in the branch uptakes should be maintained for effective performance.

Exhaust Piping Pointers

(1) Main headers and branch connections should be laid out as short and straight as conditions permit. All branches should enter the main header at an angle not less than 45 degrees and in the top or side. Where the junction is made in a tapered section the connection should be at the larger end of the enlarging piece. Care should be taken that two branches are not brought into a main exactly opposite one another.

(2) Clean-out openings with tight covers should be

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provided at all points where the dust load is liable to settle from the air stream. Provisions should be made so that the entire system can be cleaned easily in event of clogging, etc. Dead ends should be fitted with removable caps for inspection and cleaning.

(3) Pipe elbows should be made of heavier gauge material than straight pipe of the same size, as there is additional wear on the elbows owing to change in direction of air flow. It is considered good practice to fabricate elbows of material two gauges heavier than straight pipe of corresponding diameter. An elbow should be a smooth curve with a center line radius 1½-2 times the pipe diameter.

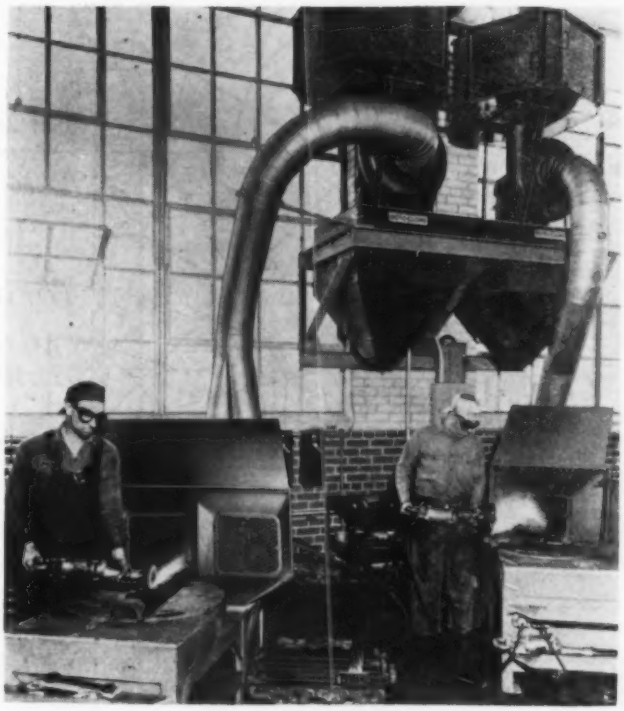
(4) Exhaust piping should be supported securely so that in event of clogging, etc., there will be no danger of distortion or collapse.

(5) Joints, circular and longitudinal, in exhaust piping, should be made tight to prevent air leakages. It is considered good practice to lap, rivet and solder such joints. Longitudinal joints may be grooved and locked with satisfactory results. Circular joints should be lapped in the direction of the air flow. Welded pipe is suggested for systems subjected to excessive abuse or wear. Such pipe should be flanged and bolted together with proper gaskets between flanges.

Portable Hand Grinders

Because of the nature of their use, etc., it is impracticable to install exhaust hoods on portable hand grinders as ordinarily used in foundries. There has been, however, an increasing interest in the possibilities of exhausted work benches and grinding stations. The severity of the dust exposure arising from these grinding operations is dependent largely upon the condition of the casting being processed. If uncleaned or poorly cleaned castings are being ground regularly the possibility of a serious dust exposure is evident.

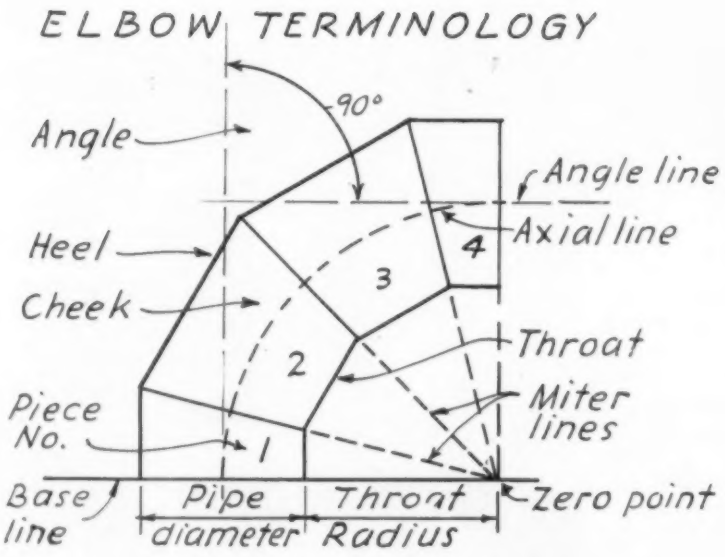
The accompanying photographs show various types of booths and benches for stand and portable grinding. In all cases the arrangement is such that the exhaust air is pulled—past or away from—the workers into adequate exhaust hoods. The booth arrangement provides directional control of air currents and does not interfere with movements of operators. A swing frame grinder can be installed in such a booth with modification to provide for the movement of grinder necessary when in use.



With turntable grinding benches, path of dust travel from portable grinding wheels can be readily directed toward side hoods.

Booth type enclosures for portable grinding wheels provide freedom for operator and permit a wide variety of work to be handled.

Unit "Roto-Clone" grinding benches and wet collectors offer control for grinding, buffing, burring, filing operations for dangerous dusts such as magnesium.



Round Elbows of Welded Construction

Part I

By J. P. Harner

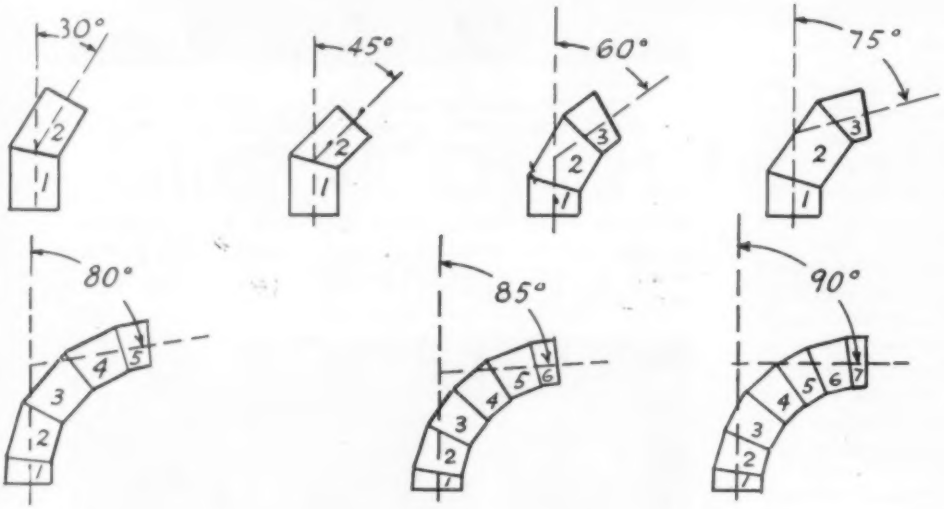


Fig. 0 Elbows of various angles and number of pieces.

THE articles in this series are, in condensed form, a set of instructions for developing patterns for welded round elbows of any size, throat radius, number of pieces, or angle, from any metal that can be welded. The determining factors for size and weight are the welder's ability and equipment.

A chart is furnished for determining the angle of the miter line in making the preliminary drawing for all elbows from 2 to 10 pieces and from 10 to 90 degree angle. Instructions are furnished for determining the miter angle in elbows from 91 to 180 degrees.

The angle chart is a simplified method for determining the angle of the miter line for the first piece in any round elbow. An explanation of its operation need be only a short paragraph for those familiar with each phase of elbow construction; however, for those who do not possess such training and wish to understand the fundamentals of elbow construction such an explanation of the chart would be of little practical value. Therefore, these instructions will begin with the terminology of the elbow and take the reader step by step through each phase of construction to the finished product.

In order to design the correct type of elbow these general suggestions apply: Elbows in new pipe systems are usually shown by blueprints from which all data may be taken without further effort. On new work not shown by blueprints, the angle for the elbow must be determined on the location and a decision made regarding the throat radius and the number of pieces for the most efficient operation of the pipe system. On replacement work three conditions usually exist: 1. Where an elbow is worn out or damaged and must be duplicated. 2. Where an elbow is worn out or damaged and must be replaced by one having more pieces for better operation. 3. Change in the pipe system necessitating an elbow of different angle.

The work of constructing the elbow can be broken down into the operations listed below and described in detail later in the article:

First operation: Use the chart to determine the angle of the miter line and lay out the simplified preliminary drawing.

Second operation: Lay out the patterns on the metal sheet.

Third operation: Cut, form and check 1 and 2.

Fourth operation: Weld the pieces.

Terminology

Fig. 0 shows the side elevation of a 4-piece, 90-degree elbow and the commonly used name for each part. The angle (not the axial angle) is shown by dotted lines in each of the seven small figures.

To determine the angle of elbows: From blueprints or drawings determine the exact angle and other data as shown. Where verbal instructions by the owner or his agents describe the proposed pipe layout, the best method for determining the angles of all elbows of more or less than 90 degrees is to stretch chalk lines representing the center line of the proposed run of pipe. Where the lines cross, the angle can easily be secured with a simple wood stay. A wood stay for this purpose can be constructed as shown by Fig. 1. It is made from two pieces of wood, say, 1x4 and 3 ft. or more in length. Fasten the pieces together near one end with a single nail as shown, so the legs may be opened and closed like a pair of dividers. The nail should be tight enough so when one leg is extended it will remain in that position until forcibly closed.

After the chalk lines are stretched tightly in place, open the stay and fit the legs to the exact angle of the crossed lines. Mark on one leg of the stay the point of opening so that the stay may be closed and reopened later to the same setting. A number of angles may be checked in succession by numbering each setting.

Angles to Degrees

To determine the angle in degrees, open the stay to the desired setting, lay a protractor over the wood stay as shown in Fig. 2, with the center or zero point of the protractor over the inner intersection of the

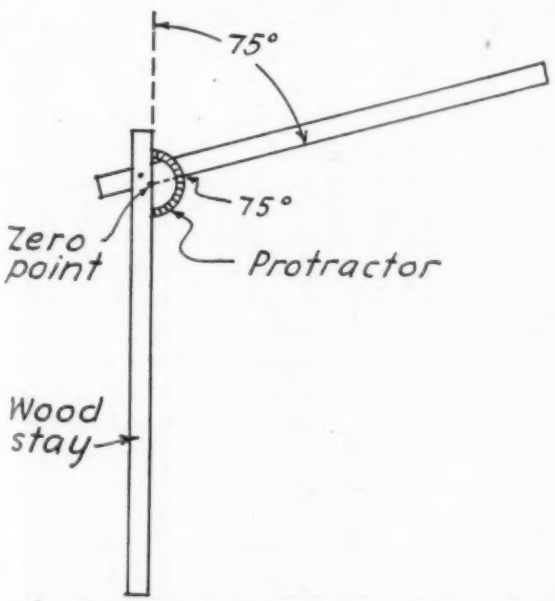


Fig. 2 Checking stay with protractor.

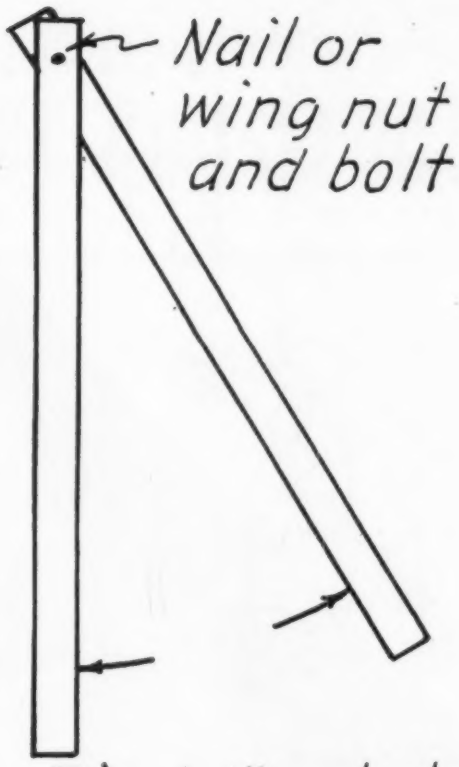


Fig. 1 Wood stay

legs, keeping the base line parallel with the inner edge of the vertical leg. If the protractor is made of clear plastic the reading may be taken directly from the scale on the inner edge of the extended leg. Otherwise lay a short straight edge over the top of the protractor even with the inner edge of the extended leg and intersecting the zero point. Take reading from protractor.

Throat Radius

The throat radius is governed to a great extent by the material being conveyed through the pipes and the velocity of air that carries the material. Where possible, the largest throat radius possible is always recommended.

In exhaust systems an angle or elbow causes a change in velocity, thus dynamic loss varies with the degree of the angle. An elbow of less than two pipe diameters throat radius should not be used.

Fig. 3 shows the frictional loss in diameters of pipe for various elbows. It is interesting to note that on elbows of more than two pipe diameters throat radius the frictional loss increases. Fig. 3 shows the need of using care in selecting the proper throat radius on elbows. The axial line is used in computing the length of an elbow.

For low velocity heating, smoke pipe and breeching work 90-degree elbows having ½ pipe diameter throat radius are commonly used.

Number of Pieces in an Elbow

The number of pieces making up an elbow has a direct bearing on the dynamic loss. The larger the number of pieces, the less this loss. This also increases the expense of construction. From years of experience, some companies recommend the following

FIG. 3 FRICTION IN DIAMETERS OF PIPE FOR VARIOUS ELBOWS

Throat radius of elbows in dia. of pipe.	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2
No. of Dia. of straight pipe offering same resistance.	35	18	13	10	7.5	6	5	4.3	4.5	4.8	5	5.2	5.5	5.8	6

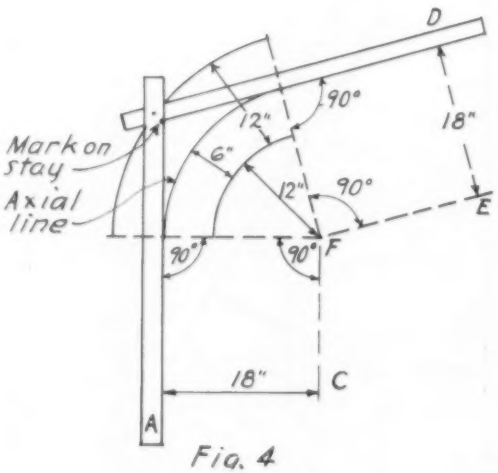


Fig. 4

number of pieces as a minimum work in 90-degree elbows:

In high velocity systems—Up to 6 inches in diameter, 5 pieces; 6 to 12 inches, 7 pieces. For elbows above 12 inches, 9 pieces.

In low velocity systems—A 90-degree elbow having 3 to 4 pieces will operate quite satisfactorily.

If the system is handling a material with an abrasive action, the elbows should be at least 2 gauges heavier than the pipe.

Length of the Finished Elbow

It is good practice to determine in advance the length of the finished elbow as different parts of the same system may be made up at the same time by different mechanics, then assembled into sections as large as can be conveniently handled.

To determine the overall length of an elbow, open the wood stay to the desired setting and lay on the floor or other surface where chalk marks may be drawn (see Fig. 4).

Having decided on the throat radius, measure out from the face of leg *A* one-half the pipe diameter plus the throat radius, mark and run line *C* parallel to the face of *A* as shown. Measure out from the face of leg *D* the same distance (one-half pipe diameter plus throat radius), mark and run line *E* parallel to the face of leg *D*. Where these lines intersect as shown by *F* draw lines at right angles to the face of *D* and *A*. The space between these lines represents the *outside* dimensions of the elbow. Fig. 4 shows the outline of the elbow between the lines; this is not necessary unless one wishes to do so for practice purposes. The elbow shown in Fig. 4 is for a 12-inch, 75-degree elbow having a throat radius of one pipe diameter or 12 inches for low velocity operation.

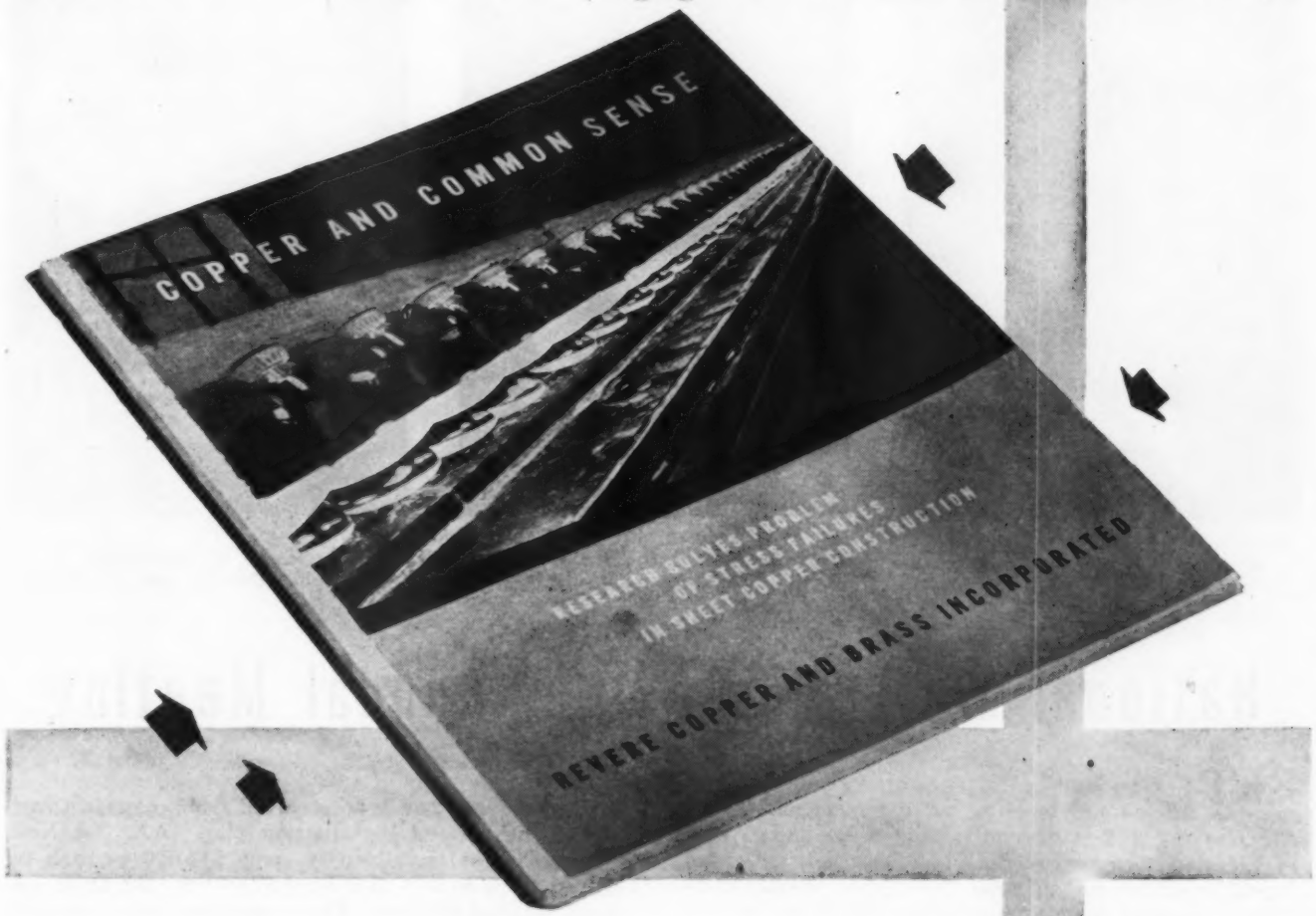
(*Continued on page 212*)

Angle of Elbow in degrees — Number of Pieces in elbow

	2	3		2	3	4	5	6	7	8	9	10
10	5		50	25	12 1/2							
11	5 1/2		51	25 1/2	12 3/4							
12	6		52	26	13							
13	6 1/2		53	26 1/2	13 1/4							
14	7		54	27	13 1/2							
15	7 1/2		55	27 1/2	13 3/4							
16	8		56	28	14							
17	8 1/2		57	28 1/2	14 1/4							
18	9		58	29	14 1/2							
19	9 1/2		59	29 1/2	14 3/4							
20	10		60	30	15	10						
21	10 1/2		61	30 1/2	15 1/4	10 1/6						
22	11		62	31	15 1/2	10 1/3						
23	11 1/2		63	31 1/2	15 3/4	10 1/2						
24	12		64	32	16	10 2/3						
25	12 1/2		65	32 1/2	16 1/4	10 5/6	8 1/8					
26	13		66	33	16 1/2	11	8 1/4					
27	13 1/2		67	33 1/2	16 3/4	11 1/6	8 3/8					
28	14		68	34	17	11 1/3	8 1/2					
29	14 1/2		69	34 1/2	17 1/4	11 1/2	8 5/8					
30	15		70	35	17 1/2	11 2/3	8 3/4	7	5 5/6	5	4 3/8	3 15/18
31	15 1/2		71	35 1/2	17 3/4	11 5/6	8 7/8	7 1/10	5 11/12	5 1/14	4 7/16	3 9/9
32	16		72	36	18	12	9	7 1/5	6	5 1/7	4 1/2	3 17/18
33	16 1/2		73	36 1/2	18 1/4	12 1/6	9 1/8	7 3/10	6 1/12	5 3/14	4 9/16	4
34	17		74	37	18 1/2	12 1/3	9 1/4	7 2/5	6 1/6	5 3/7	4 5/8	4 1/18
35	17 1/2		75	37 1/2	18 3/4	12 1/2	9 3/8	7 1/2	6 1/4	5 5/14	4 11/16	4 1/9
36	18		76	38	19	12 2/3	9 1/2	7 3/5	6 1/3	5 1/7	4 3/4	4 1/6
37	18 1/2		77	38 1/2	19 1/4	12 5/6	9 5/8	7 7/10	6 5/12	5 1/2	4 13/16	4 5/18
38	19		78	39	19 1/2	13	9 3/4	7 4/5	6 1/2	5 4/7	4 7/8	4 1/3
39	19 1/2		79	39 1/2	19 3/4	13 1/6	9 7/8	7 9/10	6 7/12	5 9/14	4 15/16	4 5/13
40	20	10	80	40	20	13 1/3	10	8	6 2/3	5 5/7	5	4 4/9
41	20 1/2	10 1/4	81	40 1/2	20 1/4	13 1/2	10 1/8	8 1/10	6 1/12	5 1/14	5 1/16	4 1/2
42	21	10 1/2	82	41	20 1/2	13 2/3	10 1/4	8 1/5	6 1/6	5 2/7	5 1/8	4 5/9
43	21 1/2	10 3/4	83	41 1/2	20 3/4	13 5/6	10 3/8	8 3/10	6 11/12	5 3/14	5 3/16	4 1/18
44	22	11	84	42	21	14	10 1/2	8 2/5	7	6	5 1/4	4 2/3
45	22 1/2	11 1/4	85	42 1/2	21 1/4	14 1/6	10 5/8	8 1/2	7 1/12	6 1/14	5 5/16	4 1/18
46	23	11 1/2	86	43	21 1/2	14 1/3	10 3/4	8 3/5	7 1/6	6 1/7	5 1/8	4 1/9
47	23 1/2	11 3/4	87	43 1/2	21 3/4	14 1/2	10 7/8	8 7/10	7 1/4	6 3/14	5 7/16	4 5/18
48	24	12	88	44	22	14 2/3	11	8 4/5	7 1/3	6 3/7	5 1/2	4 8/9
49	24 1/2	12 1/4	89	44 1/2	22 1/4	14 5/6	11 1/8	8 9/10	7 5/12	6 5/14	5 9/16	4 17/18
50	25	12 1/2	90	45	22 1/2	15	11 1/4	9	7 1/2	6 3/7	5 5/8	5

Chart No. 5

Better sheet copper construction



...this new book makes it crystal clear

ARCHITECTS and sheet metal experts throughout the country know that Revere research has developed important new facts about sheet copper construction for all types of buildings. Many have already consulted us, quickly grasped the new principles and applied them to the benefit of their business. Now the facts are available in book form. The *how* and *why* are made simple and clear with actual photographs, with easy-to-use charts, with dozens of full-page details covering every kind of installation.

This important 96-page book answers the questions that experienced architects and sheet metal contractors have asked themselves for years, have often brought to us as serious problems, have turned to Revere's technicians to help them solve. You need work out no engineering formulas—now you need only read and apply the final figures from large charts in order to be sure of the finest sheet copper construction that can be built.

While the limited supply is available a copy of "Copper and Common Sense" will be sent *free* to any architect or contractor requesting it. Write today on your letterhead to Revere.

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Frank E. Mehrings
President-Elect for 1946

C. S. Franke
Second Vice President

George E. Boeddener
Managing Director and Treasurer

National Warm Air Ass'n. Annual Meeting

THE annual meeting of the National Warm Air Heating and Air Conditioning Association, held in Cleveland, December 5 and 6, was not the usual "open" meeting due to hotel and transportation difficulties. Instead some 70 committee and Board of Director members met to elect officers and transact necessary business. The result was a meeting which "got right down to business" and concluded extensive and far-reaching decisions and plans exceeding anything in the entire history of the association.

Advertising, Dealer Training

The Advertising, Publicity and Dealer Training program, with an estimated starting fund of $100,000 and final objective of $200,000, was unanimously approved for action in 1946 by the Board of Directors. Briefly this program will include:

a) A man and necessary facilities to manage a dealer training and advertising program through dealer schools and bulletins and other services to dealers.

b) A man and necessary facilities to promote the advertising and publicity program to reach consumers and the industry and to supervise the development of two very effective booklets—one for consumers and one for architects and general contractors, in addition to other dealer helps.

c) Full-page advertisements appearing monthly in each of the following magazines: Architectural Forum, Practical Builder, American Builder.

d) Advertisements in consumer magazines, not yet detailed, commensurate with available funds.

The Publicity and Merchandising Committee reported that as of the date of the meeting more than $56,000 in cash had been received from manufacturers under the revised contribution plan (AA, Oct.-Nov., page 163) which, added to some $14,000 in cash received from dealers and some $7,000 in cash from jobbers, totalled $77,000. The committee feels sure that in a matter of weeks the total will be $100,000, which is enough to launch the program. The committee held preliminary discussions on the allocation of these funds to activities such as advertising, consumer booklets, dealer schools, a dealer division manager, etc., and will meet again to make final decisions.

Research and Research Residence

The Board of Directors also approved for 1946 a budget of $60,000 for:

a) Building a new research house at a cost of $17,500 in the new "Home Research Center" of the University of Illinois at Urbana. This house will be the first one to be built in the "Home Research Center" and as such will result in nation-wide publicity very favorable to the warm air heating industry.

b) Doubling the size of the operation of the research program compared to 1945.

c) Operation and expansion of the Cleveland office.

These plans and operation costs, approximating an expenditure of $160,000 with a possible ultimate expenditure of $260,000 for 1946, go far beyond anything heretofore undertaken by the Association during its thirty-two years of continuous service. The efforts to be put forth next year and years following will assuredly raise installation standards, assure owner satisfaction and increase consumer acceptance and marketing opportunities. Discounting current labor and material problems, the years ahead promise the

most far-reaching developments of the industry since the time the first warm air furnace was installed in Worcester, Mass., in the year 1836.

The 122 manufacturer, 214 dealer and 53 jobber members of the Association, totaling 390—and with substantial additions on the way—can be a powerful force for promoting consumer acceptance and higher standards for the industry. New and revised lists of members will be issued in the near future.

New Special Committee

President H. P. Mueller, before concluding his second term of office, appointed a "Critical Industry Committee" and a "Planning Committee."

The "Critical Industry Committee" will make an effort through personal contacts in Washington to have the furnace manufacturing industry classified as critical. Such a classification should make available more equipment for factory production and additional labor along with the possibility of a greater supply of raw materials.

"The Planning Committee" was formed for the purpose of coordinating all of the new departments and activities of the Association.

Officers and Board Members

At the meeting the following men were elected:

Officers—One Year Term

F. E. Mehrings.....President
Atlee Wise .....1st Vice President
C. S. Franke.....2nd Vice President
Geo. Boeddener....Managing Director and Treasurer

Board of Directors—Two Year Term

P. T. Cheff.....1946-1947
E. B. Lau.....1946-1947
W. L. Seelbach.....1946-1947
A. W. Wrieden.....1946-1947

Board Members Expiring in Dec., 1946

R. W. Blanchard C. L. Rowley A. L. Rybolt

Ex-Officio Member of the Board

H. P. Mueller (Past President)

Committee Activities

The activities of the committees are pretty well summarized in the resolutions each committee submitted to the Board of Directors. Following are the resolutions, briefed:

Jobbers Division—

Newly elected officers for this division shall be: Arthur M. Vorys, Chairman; John E. Phillips, Vice Chairman; H. S. Sharp, Secretary.

The jobbers committee suggests that the term "Winter Air Conditioning" be used by everyone in the industry in place of "Forced Air Heating." Warm air, winter air conditioning fully meets the definition of the American Society of Heating and Ventilating Engineers; our industry has accepted the term, and the public, generally, think of forced warm air heating as winter air conditioning.

The jobbers committee recommends that a letter be sent to all jobber subscribers to the advertising program asking for an immediate remittance. The committee also recommends that the advertising program be started at once with whatever funds are available and that the program be enlarged as more money comes in.

The jobbers committee, after reviewing recent rulings of the OPA, recommends that to avoid disrupting normal trade channels any ruling or order issued by OPA should contain a paragraph specifying that no provision of any such order shall require a jobber to sell a manufacturer's product to a dealer at a price lower than provided for sales from the manufacturer to the dealer direct. (The Board of Directors question whether or not their recommendations will have any weight with OPA and point out that up to date the manufacturers have made no headway with OPA on their own problems and questions submitted months ago.)

The jobbers committee suggests that the standardization of pipe and fittings (AA, Jan., 1945) be further simplified by assigning a number to each fitting so that the fitting can be ordered by that number.

C. L. Rowley
Director, 1945-1946

R. W. Blanchard
Director, 1945-1946

A. L. Rybolt
Director, 1945-1946

A. W. Wrieden
Director, 1946-1947

P. T. Cheff
Director, 1946-1947

W. L. Seelbach
Director, 1946-1947

(This suggestion was received favorably and decision assigned to the Air Distribution Institute for study.)

Finally, the Jobbers Division is now a permanent part of the NWAH&AC Assn.

Dealers Division—

As reported in AA, the Dealers Division has been anxious that a program of dealer education be set in operation as soon as possible. To initiate and operate such an activity the Dealers Division offered the following suggestions to the Board:

(1) That as soon as possible a Certificate of Membership in the Dealers Division of the N. W. A. H. & A. C. Assn. be prepared and mailed to each dealer who has paid his subscription.

(2) That a joint committee, consisting of dealers and other representatives of the now standing or special committees which you may appoint, be authorized to work out as soon as possible a program of dealer service which would embrace the following:

"Dealer educational schools to cover engineering, installation, sales and service, together with booklets, bulletins, literature, etc., which may be necessary."

(3) That the above committee, with your approval, shall employ a capable full-time field representative who, under the committee's direction, shall head up this dealers training program.

Previous experience has proven that dealer schools can be made self-sustaining and are in great demand. Also, these schools will provide a splendid opportunity to interest and encourage dealers to become members of our Association and better acquaint them with the program which our Association has carried on since its conception.

(4) We suggest that a careful study be made for future financing which should perpetuate this plan.

(The certificate has been ordered and will be distributed to dealer members as soon as possible. The program of service suggested will be worked out as one of the first duties of the to-be-hired director of dealer activities.)

E. B. Lau
Director,
1946-1947

Installation Codes Committee—

The report of the Installation Codes Committee was accepted and approved by the directors. In summary this report suggested:

The Installation Codes Committee has tried to use this period of restricted output and transition from war to peace as a time to simplify, consolidate and unify existing codes and heating data into new combined codes and manuals that could and would be universally used by the industry.

(Continued on page 246)

ASSOCIATION ACTIVITIES

Ohio

The Ohio Sheet Metal Contractors' Association will hold the annual convention at the Deshler-Wallick Hotel, Columbus, on March 25, 26 and 27th.

A. E. Bogen, Secretary.

◆

Buffalo

At the January 9 meeting of the Buffalo Sheet Metal, Warm Air Heating and Air Conditioning Association, the following new officers were installed for 1946:

President—Leo J. Olear
1st Vice Pres.—Walter J. Schwippert
2nd Vice Pres.—Harry E. Yost
Secretary—Murton J. Rodman
Financial Secretary—L. J. Wieman

The speaker of the evening was L. J. Monahan of Surface Combustion Corporation, who urged cooperation between manufacturer, jobber and dealer to produce the best in warm air heating installations. By displaying a sample airplane heater, he impressed the members with the folly of some of the earlier post war predictions and assured them no radical changes were contemplated in equipment.

The new president reviewed the information contained in the Code and Manual of the National Warm Air Heating and Air Conditioning Association and discussed that association's advertising program. He outlined increases so far authorized by OPA on house heating equipment and mentioned other price revisions that are expected to follow; also, the government's revision of the priorities system, aimed at channeling materials into new home construction, was explained.

Entertainment in the form of magic was well applauded after the dinner. Attendance, 36.

Meetings of the Buffalo association are held the first Wednesday of the month at the Markeen Hotel.

Murton J. Rodman, Secretary.

◆

Florida

The December 21 bulletin of the Roofing & Sheet Metal Contractors' Association of Florida invites members to send in questions or suggestions for the consideration of officers and directors.

The Hon. J. Edwin Larson called a meeting on December 17 relative to rates for workmen's compensation now prevalent. At the August meeting it was decided to await the Florida Industrial Commission's compilation of figures to determine the question of lowering of rates. An overall reduction of 5.5 percent was made. Apparently, from the figures of the Industrial Commission, there has been a gross take by the insurance companies of approximately 52 to 54 per cent, which is above the allowable rate of 40.5 per cent. The consensus of opinion is that there should be a further reduction of rates of approximately 10 per cent. The association suggests individual inquiries as well as the association as to the outcome of the December 17 hearing.

Officers and directors wish each and every member a most happy and prosperous new year.

Association members wishing to get away from the cold weather in the north for a few days are invited to join in a little fishing.

J. T. Stewart, Secretary-Treasurer.

Corrosion Engineers

The National Association of Corrosion Engineers, an association of and for all individuals actively engaged in the control of corrosion to metallic structures, with headquarters at 313 Southern Standard Bldg., 711 Main Street, Houston 2, Texas, announces dates of May 7, 8 and 9 for its 1946 annual meeting and convention, to be held in Kansas City, Missouri, in the President Hotel. In addition to the technical programs covering the three days' sessions, there will be an exhibition of corrosion-resistant, corrosion-mitigation and various types of protective materials in the main arena of the Municipal Auditorium.

Technical sessions are scheduled for the same building, in the Little Theatre there, and in such additional space as may be required to accommodate the sectional and group meetings. The program as outlined includes papers on corrosion practices as developed in representative industries, such as power plants, municipal and other waterworks, transportation companies, buried communication lines, refineries, chemical manufacturing and processing plants, and oil pipe lines. Simultaneous sessions are scheduled to permit coverage of the program within the allotted time.—Elton Sterrett, Executive Secretary.

Coming Conventions and Meetings

1946

Feb. 4-5—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. Annual. Antlers Hotel, Indianapolis. Homer Selch, Secy., 946 Hosbrook, Indianapolis 3.

Feb. 18-19—Sheet Metal Contractors' Association of Wisconsin, Inc. 31st Annual. Schroeder Hotel, Milwaukee. Paul L. Biersach, Secy., 225 E. Michigan, Milwaukee 2.

Mar. 18-20—Michigan Sheet Metal, Heating & Air Conditioning Contractors' Assn. Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secy., 719 Boulevard Bldg., Detroit 2.

Mar. 18-21—Michigan State College Short Course. Fifteenth Annual. Elementary and Advanced. Lorin G. Miller, Head, Dept. M. E., East Lansing.

Mar. 25-27—The Ohio Sheet Metal Contractors' Association. Annual Convention. Deshler-Wallick Hotel, Columbus. A. E. Bogen, Secretary, 334 E. Livingston Ave., Columbus.

April 2-3—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc. Annual. Hotel Statler, Buffalo. Clarence J. Meyer, State Secy., 567 Genesee St., Buffalo 4.

Apr. 8-9—Illinois Sheet Metal Contractors' Assn., Jefferson Hotel, Peoria. W. Rex Shaw, Secy., 695 E. State St., Jacksonville.

Apr. 15—Syracuse University Short Course. Syracuse University, Syracuse, N. Y. National Warm Air Heating and Air Conditioning Assn., 145 Public Square, Cleveland 14, Ohio. George Boeddener, Man. Dir.

May 2-4—Sheet Metal Contractors' National Association, Inc. Convention. Hotel Statler, St. Louis. Clarence J. Meyer, Natl. Secy., Buffalo 4.

Carolinas' Conference

The annual conference of the Carolinas Roofing and Sheet Metal Contractors Association was held on December 6 at the Poinsett Hotel, Greenville, South Carolina. More than 70 delegates attended. President **L. K. Flynt** presided, **Joe H. Piper** of Greenville was chairman of the local committee on arrangements. Other members of the committee were **V. D. Ramseur** and **J. A. Piper.** Following a welcoming message by Mayor Fred McCullough of Greenville, President Flynt addressed the group.

The morning session consisted of reports by various committees and officers:

Horace T. King, secretary and treasurer, read the minutes of the previous meeting, and the financial report.

Hilton Bowles, chairman of the architectural committee, suggested that each member send him problems that should be taken up with the architects, and to be discussed at the next meeting. He stressed the fact that the association should work with the architects and engineers, and be of assistance to them rather than try to pick some flaw in their methods.

Victor King offered two resolutions, which were approved, and the secretary was instructed to send them to J. A. Piper and to Clarence J. Meyers.

J. A. Piper of the emblem committee, recommended the use of job signs, and submitted a new scratch pad which has been developed for the use of members. These scratch pads are printed in two colors and are arranged so that the different roofers, metal workers, or heating men can set in their names, advertising their business as well as the association. These scratch pads in 1,000 lots will cost $80 to $82 per thousand. J. A. Piper, Box 599, Greenville, S. C., will be glad to give further information. These scratch pads are sold at cost.

W. P. Baker reported on the training of mechanics. The most interesting part was the On-the-Job Training of Veterans. Shops who have tried this plan report that it seems to be working out in a worthwhile manner. They are getting some good men started and a large percentage of them should make real mechanics.

Victor King, chairman of the publicity committee, is handling releases to the newspapers throughout the Carolinas, but still wants the names of the papers that cover each locality. He asks each member to write or just tear off the heading of their local paper and mail to J. V. King, Sanford, N. C.

Vardry D. Ramseur presided at the luncheon for members and their ladies.

F. L. Shackelford of Greenville, past president of the Carolina Division of Associated General Contractors, talked on "The Necessity of Associations."

Dr. John McSween addressed members and wives at the luncheon. His topic was "Some Fundamentals."

Following the luncheon, reports of the legislative committes were heard. **Earl DeLay** heads the North Carolina committee and **W. P. Baker** heads the South Coralina group. **Vardry Ramseur** of Greenville made the South Carolina report of the Insurance Committee, and **V. E. Bell** spoke for the North Carolina group.

George Averett, chairman of the membership committee, reported seven new members, and expects a total of fifteen additional members by the May meeting.

W. T. Fort, reported for the sick and welfare committee. He stated that while they are covering a good deal of territory, they are endeavoring to keep in contact with members.

Mrs. Joe Piper, Jr., of Greenville directed the affairs of the women's group. Wives of members were entertained in the morning with a tour of the city, and a shopping tour following the luncheon.

W. P. Baker made a motion, seconded by **V. D. Bell,** that the association contact the steam heating association and ascertain if they would like to send a representative to warm air meetings, and the warm air group have a representative at their meetings. The subject was discussed freely, and it was decided that we should make a special effort to work closely with this steam heating association and all other associations of the construction industry. The motion was adopted.

The date and place of the next meeting of the Carolinas organization will be determined at a meeting of the directors to be held at Pinehurst, N. C., next May.

ALLEN Here's Your Directory of Quality Soldering Supplies

ALLEN ALL-METAL SCRATCH BRUSHES
(Item 16-13)

A remarkable brush for speedily removing rust, corrosion, brightening metal. Brush is all metal, hence can be used under torch flame, etc. Brush can be cut off at end, thus renewing life as front end wears down. Bristles of tough, strong steel. Three brushes like illustration. Also one all metal brush, "straight-construction" for battery work, etc. Large, medium and small sizes.

ALLEN SODERING SALTS
(Item 1-01)

An all around flux in convenient powder form; just add water 3 to 5 times according to metal to be sodered. Soders all metals but aluminum. Takes a quick bite and makes the soder hold on. Non acid. Comes packed in metal or glass as preferred. ½ lb., 1 lb., 5 lb. sizes.

ALLEN "ALL-SOL" STAINLESS STEEL SODERING FLUX
(Item 605)

Here's a remarkable, fast flux that makes the sodering of stainless steel as easy as sodering tin plate. (Also available in a special odorless formula where less strength is required). "ALL - SOL" works with all soders but for best results use Allen stainless steel soder. Pints, gallons.

ALLEN SODERING OIL
(Item 4-04)

A highly technical, concentrated sodering compound officially endorsed by the National Underwriters.

Causes neither verdigris nor corrosion. Gets into the tiniest crevice and takes the soder along with it. Makes perfect electrical and mechanical joints. For hand or machine sodering. Excellent for sweat sodering copper pipe joints. 1 lb., 3lb. and 12 lb. sizes.

ALLEN Neutral Rosin Fluid Flux
(Item 0-08)

This is a flux of absolute safety for electric motors, telephones, radio, commutators, instrument work, fine wires, etc. This flux is so safe you can spill the flux on the work allowing it to remain forever with no corrosion hazard to the finest wire or metals. Allen Neutral Rosin Fluid Flux is absolutely neutral and moisture free and absolutely non-conductive to electrical current. Quarts and gallons.

ALLEN ALUMINUM SODER
(Item 22-18)

Allen Alumi-Soder is a complete soder and flux combined. Requires only heat to permanently join aluminum to itself or other metals. Comes in ⅛" square wire form and triangular ¾ lb. and 1 lb. bars. Also in popular trial size pieces, called 9 inches pieces. ¼ lb. and 1" bar and wire form.

Also soders cast-iron

ALUMI—SODER

ALLEN SODERING ACID
(Item 9-07)
(Formula G. I.)

An active sodering acid for galvanized and hard-to-soder metals; and old metal that has been exposed to the weather. Works well on monel metal (white label shipping regulations). Quarts & gallons.

Note: For "all-a-round" sodering on new and fairly clean work use **Allen** Sodering Liquid (see No. 6 above.)

Note: For sensitive electrical sodering see No. 8 directly below.

ALLEN SODERING LIQUID
(Item 8-06)

Standard Formula. For all-a-round work, for all metals save aluminum and stainless steel. 17,000 pounds to the square inch with no gumming, fumes, or corrosion. Double strength, non-evaporating. Works like Lightning. Adaptable to hand, or machine sodering. Excellent for tinning the sodering copper. 2 oz., 4 oz., quarts and gallons.

ALLEN EZY-FLO Torch Formula Sodering Paste
(Item 2-A)

A special sodering paste for torch and "sweat joint" sodering. Also works well with the sodering iron. Comes in same sizes and at same prices as "Standard Formula." 2, 4, 8, 16 oz.

ALLEN SODERING PASTE
(Item 2-02)

Standard Formula, Safest sodering paste made — fast working—a convenient corrosion-free, soft form of flux. Adheres to the surface while you soder. Assures secure electrical and mechanical joints. Saves time. Triples strength of the soder. Makes soder self-fluxing. Official National Underwriters' Laboratory approved listing. 2, 4, 8, 16 oz.

SILVER SODER
WIRE AND RIBBON FORM
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Wire form for all around work. Excellent tensile strength, high vibration and corrosion resistance. Gives rigid, good color joint.

Ribbon form same specifications as wire. (For band saw **Wire Form** work.)

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Provides quick, smooth flow giving deep sound silver soder penetration on most metals including stainless steel. 1 lb. and 5 lb. sizes.

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Deep set bristles of good quality held tightly in heavy gauge holder; securely crimped, no jagged edges or rough metal exposed. No. 2 and No. 1 sizes.

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- **B)** Breaking strength of Wire Soder (Shows tin-lead proportions).
- **C)** Length of one pound of Wire Soder in various sizes and alloys.
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Jobber .....

L. B. ALLEN CO. INC. SODERING SUPPLIES

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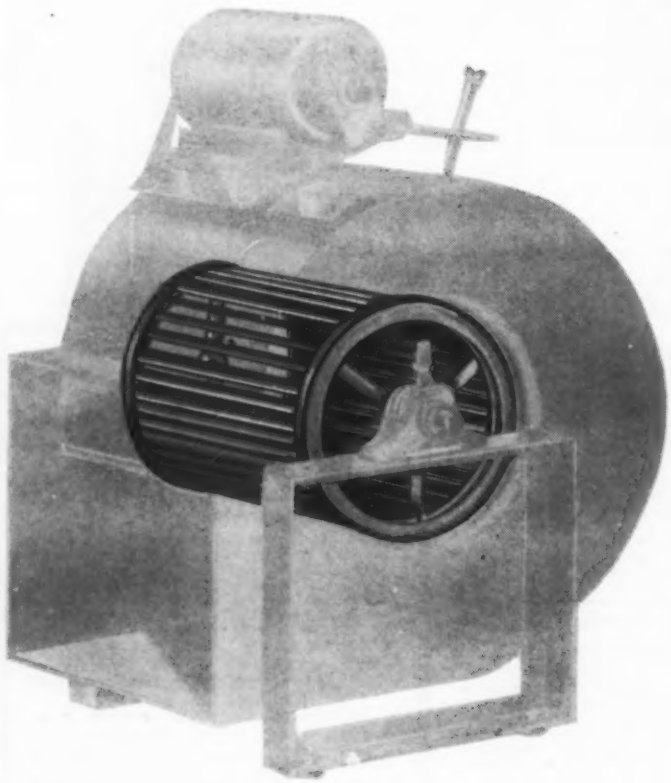
CHICAGO 31, ILL.

MORRISON Airstream



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We also furnish housing squares or sides to customers who prefer to purchase same.

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Please send us the NEW BULLETINS on the products we have checked:

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- ☐ Oil Automatic Heat
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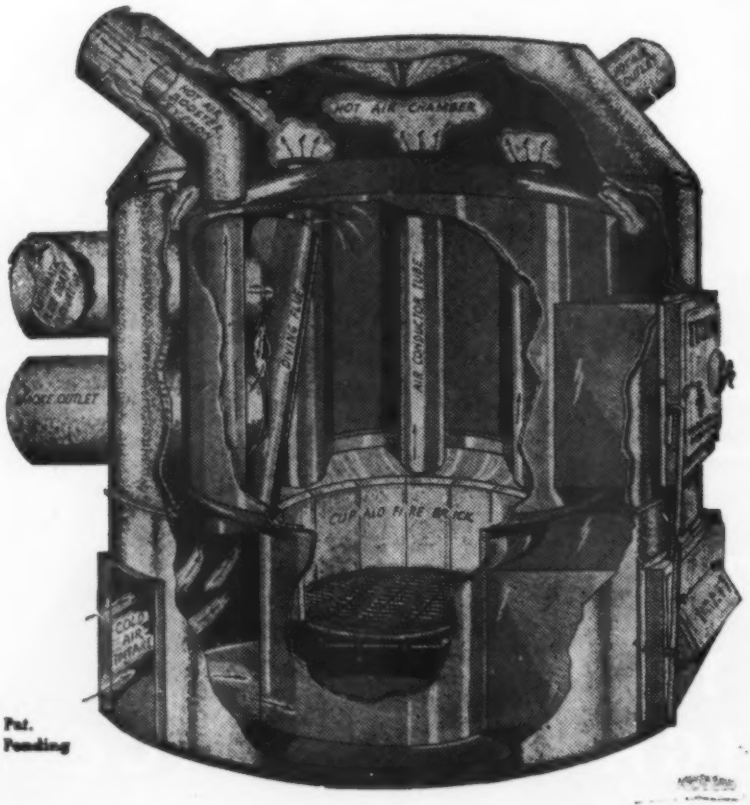

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Quality in furnace repair parts is just as important as it is in any other household appliance. It must BE THERE or no amount of expert workmanship can turn out a thoroughly dependable job.

It'll be quite awhile yet before new equipment becomes available and in order to keep homes heated in a healthful, economical manner your customers' well-worn heating plants must be maintained at their most efficient level. You can do this easily by installing guaranteed Northwestern repair parts. Northwestern has always provided the best in repairs and has enjoyed a year-to-year reputation of supplying dealers with guaranteed-to-fit parts quickly and with consistent economy.

Let the symbol of quality be your guide . . . buy from Northwestern and assure top performance on all the installations you repair. Write us today for more information.

NORTHWESTERN
STOVE REPAIR COMPANY
662 WEST ROOSEVELT ROAD CHICAGO, ILL.

YOU CAN afford to wait

The differences between the Toridheet Rotary Oil Burner and others make it profitable to wait for Toridheet.

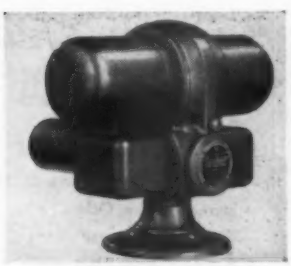
The high efficiency and the maximum economy of the Toridheet Rotary have been proven for many years; they were doubly emphasized by owners during the rationing period.

The low cost of service on the Toridheet Rotary established a new record at a time when service was difficult to give because of trained labor shortages.

Those are manifestly good reasons for waiting till you can get Toridheet.

We wish you Prosperity in its most generous form and will continue to do our part to give you burners as fast as conditions permit. The demand is big because public acceptance is so widely spread.

The minute all materials are available, Toridheet deliveries will be speeded. Meantime, we are employing every known power to increase deliveries that will make you happy.



Model 5

MEMBER OBI OIL BURNER INSTITUTE

Rotary Burner

TORIDHEET DIVISION

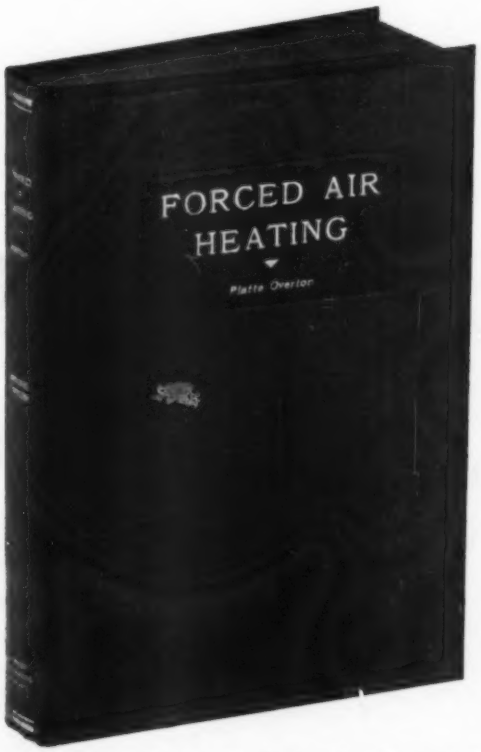
CLEVELAND STEEL PRODUCTS CORP. • CLEVELAND 2, OHIO

Oil Burners • Air Conditioning Units • Oil-Burner Boilers
Coal and Gas Furnaces • Water Heaters

This Practical

FORCED AIR HEATING DESIGNING MANUAL

Only $1.00



215 Pages—6"x9"—Cloth Bound—Illustrated
$1.00

This enlarged, second edition of FORCED AIR HEATING reduces the task of designing forced air heating systems to a simple, easy-to-follow procedure. Four reasons why contractors will find this book unusually helpful—a real time and money saver in forced air work—are these:

First—It contains every kind of information needed for designing forced air heating systems quickly and correctly, including a "mistake-proof" data sheet, tables, charts, and formulas and other essential data developed by outstanding engineers and research bodies.

Second—It outlines for you, step by step, a suggested designing procedure which you can follow in planning any job in quick time, and yet with assurance that the finished installation will perform according to specifications.

Third—It shows you shorter and easier, but thoroughly dependable methods of calculating heat losses, sizing apparatus, selecting register air temperatures, figuring pressure losses, and determining correctly all other factors that must be considered in planning a forced air heating system.

Fourth—It gives you sufficient practical information on all phases of forced air work to equip you to work out readily and correctly any unusual designing problems you may encounter on your different jobs.

FORCED AIR HEATING'S primary object is to show you how your designing problems can be speeded up and simplified. The methods this book recommends are a safe balance between the theoretically perfect procedures which require an excessive amount of time, and the haphazard methods which so often result in costly omissions or mistakes. They are procedures which have been proved completely reliable, as well as important time-savers, through successful application to many hundreds of forced air jobs of all sizes and complications.

WRITTEN IN PLAIN LANGUAGE

Every thought and device to make this second edition a practical, every-day guide to better and more rapid procedure in forced air heating design work has been included in it. It is written in the plainest possible language, and filled with illustrations and concrete examples that make each recommended procedure easy to understand and to apply.

Begin now to improve and to speed up your designing methods—equip yourself to do more and better forced air work at a better profit—by sending $1.00 today to the address below for a copy of FORCED AIR HEATING.

CHAPTER HEADINGS

—A Suggested Data Sheet
—Procedure of Design
—Sizing the Apparatus
—Infiltration
—Registers and Returns
—Multiple Registers
—Return Air System
—Selecting Register Temperatures
—Temperature Drop in Ducts
—Mechanical Code for Forced Air Heating
—Sizing Ducts by Friction Chart Methods
—Sizing Extra Long Runs
—Pressure Losses
—Velocities
—Proportioning Losses in Heating Systems
—Branch Take Offs
—Volume Dampers
—Bonnets and Plenums
—Casing Baffling
—Chimneys and Drafts
—Air Conditioning Radiator Heated Houses
—Automatic Control
—Contract and Specifications
—The Index

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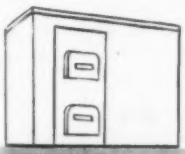
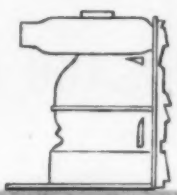
PEACETIME PROBLEMS

The Japanese surrendered August 14th—the fighting ceased — but that did not make additional furnaces immediately available—This can only come as production problems are solved—

Some of These Are and Will Be—Re-employment — Adjustment of Wages and Price Increases — Shortages of Motors—Oil Burners—Steel—Galvanized Iron — And Other Items Entering Into the Complete Heater.

As Rapidly as Possible International Will Have Its Complete Line of Gravity and Forced Warm Air Units—In Cast Iron and Steel—Hand Fired or Automatic Fired—Available in Greater Quantities Than Ever Before.





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HEATER COMPANY
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STEEL PRESS BRAKES

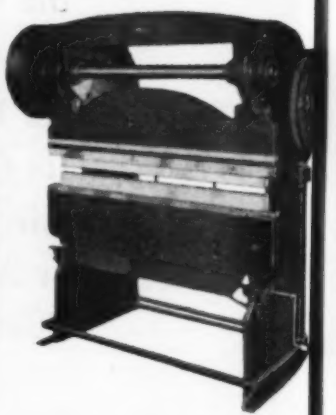
SPEEDY, precise, efficient production that will assure more sheet metal products is what we all are striving for.

Yes, this ever-increasing production means many shops and plants must make equipment additions to keep the ball rolling . . . and that's where CHICAGO Steel Press Brakes do their part to perfection.

Ruggedly constructed to assure long-life and trouble-free service, they do their given tasks, quicker, better and more efficiently. Made in sizes to handle steel sheets from 4 to 20 feet in width, and incorporating many exclusive features in design and operation, they will fit into your shop, solve your particular production problem . . . and reduce operating costs.

Save Time . . . the most important factor with D & K CHICAGO Steel Press Brakes . . .Full information and catalogue will be sent upon request.

CHICAGO—Series D Steel Press Brake has exclusive non-deflecting bed, automatic friction brake, and automatic oiling systems. Sizes 4 to 20 ft. capacities up to 5/8" plate



Standard and Heavy Duty Series . . . handles sheets from 37" to 72", cushioned-type clutch, zerk-alemite lubricating systems, quick adjustment features, variable speed drive, compact, sturdy constructions.

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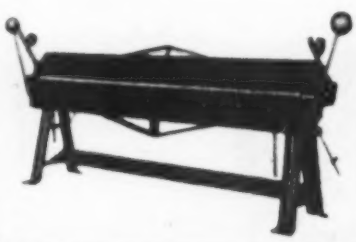

Standard hand brake, one-man operation.

Portable hand brake. Light weight, maximum strength, powerful clamping.

Box and Pan Brake. Adjustable and removable fingers permit any size box or pan to be formed.

Adjustable Double Brake for forming two bends at one setting.

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WRITE TODAY

There's a Master Pioneer Control System for every hand-fired heating plant . . . for economy, comfort, convenience.

THE MASTER ELECTRIC COMPANY, Dayton 1, Ohio
Aircraft and Electrical Controls Division

Gentlemen: Please send information about your automatic damper regulator sets.

*NAME*_____ *COMPANY*_____

*ADDRESS*_____ *CITY*_____ *ZONE*____ *STATE*_____

FOR THE WAY TO SOLID COMFORT WITH SOLID FUEL!

1

Room Thermostat.

2

Damper Motor.

3

Transformer (Items 1, 2, 3 and all fittings form basic Pioneer units).

4

Master All-Weather Control for added benefits.

complete with all fittings . . . easy to install

Pioneer controls provide automatic regulation for hand-fired heating plants with three basic, low-cost units: (1) Room Thermostat, (2) Damper Motor, (3) Transformer, including all required wire and fittings in a single package. But for maximum convenience, comfort and economy, install the Master All-Weather Control . . . to really complete the job. This new limit switch provides a unique dual function in guarding furnace temperatures—it keeps the fire from going out or getting too hot. Available for either bonnet or stack mounting. For detailed information, fill in the blanks and mail.

FOR WARM AIR • HOT WATER • STEAM

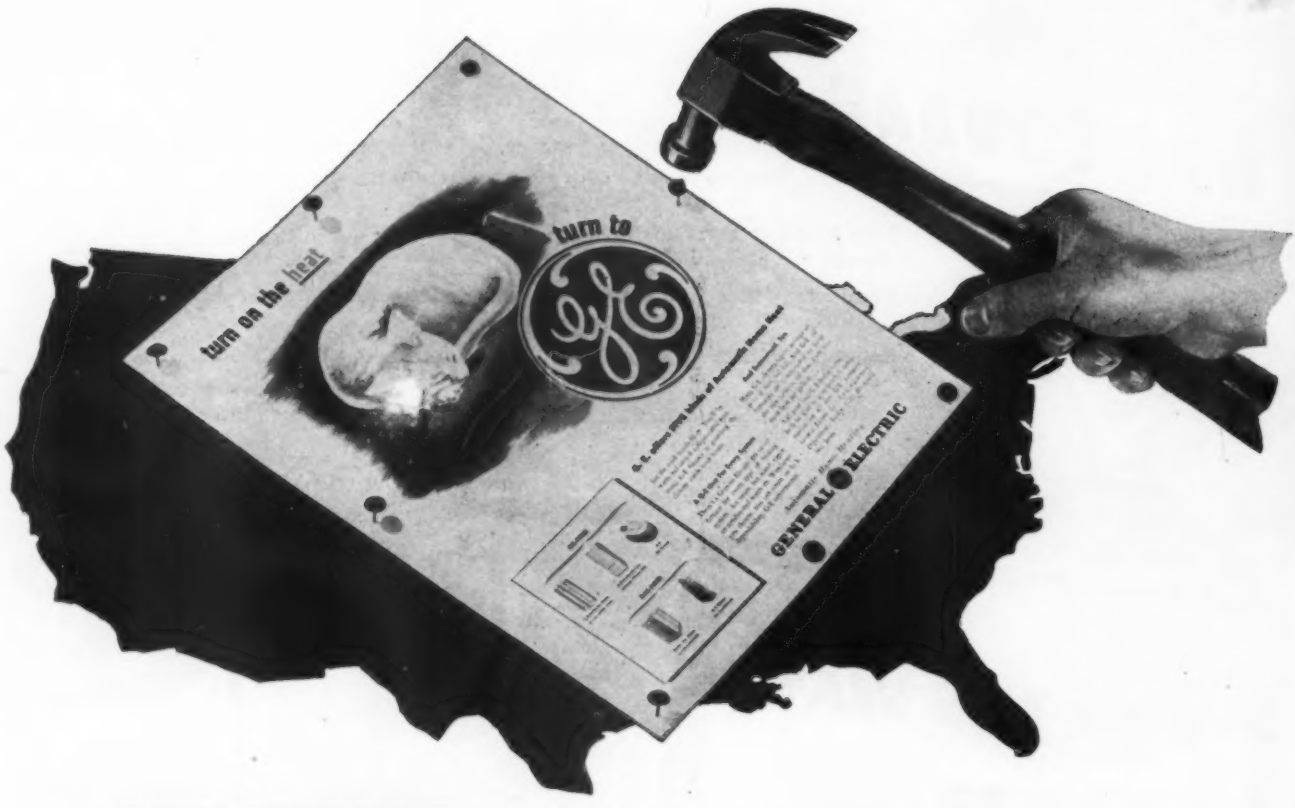
PIONEER CONTROLS

A quality product manufactured by

MASTER

The MASTER ELECTRIC Co.

Aircraft and Electrical Controls Division
DAYTON 1, OHIO



NAILING down the market for G-E dealers

The demand for G-E Heating Equipment ... gas and oil ... steam heat, hot water, and warm air conditioning . . . is really piling up. Nation-wide General Electric advertising is telling your customers this G-E equipment is well worth waiting for.

The G-E reputation for reliability, the G-E consumer acceptance ... built up by years of satisfactory service ... are going to make it a lot easier for you to sell General Electric heating equipment as soon as more of it is available.

These magazines tell your story again ... and again ... and again!

THE G-E heating story is reaching *15,000,000 families* all over the country. Advertisements in the Saturday Evening Post, Collier's, Time, American Home, Better Homes & Gardens, House Beautiful and Sunset are reaching your customers week after week, month after month ... making it easier for you to sell G-E furnaces of all types. *General Electric Company, Air Conditioning Department, Section 6531, Bloomfield, New Jersey.*

GENERAL ELECTRIC

Automatic Heating Equipment

THE HUMIDIFIER VALVE WITH
THE INGENIOUS *Snap Action*

A better valve that is being made still better—

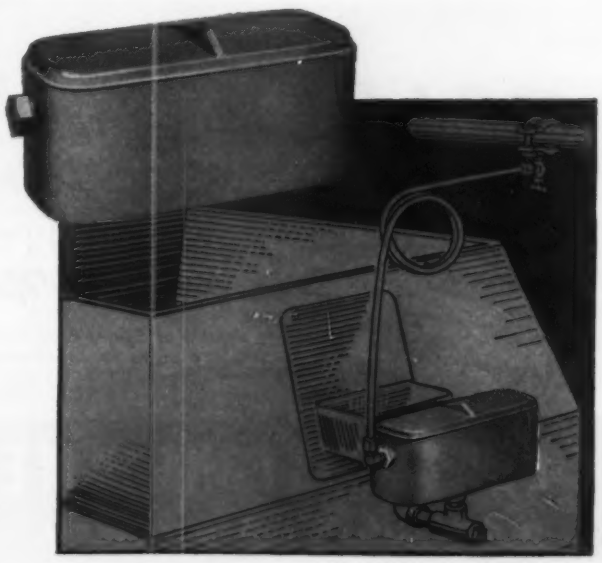
We realized that we were biting off a big chew when we started to make humidifier float valves. But, frankly, we didn't know how tough it was to be until we got all the way into it.

As you know, the conventional float valve just couldn't do this vital job right. Plainly, a valve was needed that could (1) cope with the foreign matter, lime and scale that are always present in humidifier pans, (2) seat tight against water pressures up to 150 lbs., (3) have provision for water level adjustment on the job.

To accomplish these things, we designed a snap action valve—a valve that snaps wide open when the float drops ¼-inch, opening up a full stream which flushes out the valve and seat; then closes with the same snap when the water level is restored, seating tight against water pressures up to 150 lbs. The adjustable water level was provided too, and many other refinements that reflect unparalled experience in the manufacture of water level controls.

The result was a far better valve, but, as we said at the start, there was still room for improvement. We first added a strainer, then changed valve details and float construction. During the war thousands were given severe work-outs in special applications that showed the way to further improvement. Soon this valve will again be available to you—a better valve, and, equally important, a valve that is being made ever better!

THE McDONNELL No. 417 Snap Action Valve is illustrated above. The No. 517, consisting of the No. 417 Valve installed in a die cast float chamber with cover, is shown below. Valves are adaptable to every type of warm air furnace.



McDONNELL & MILLER, Inc.
1318 Wrigley Building, Chicago 11, Illinois

Doing One Thing Well
REG. U. S. PAT. OFF.

McDONNELL *Snap Action* FLOAT VALVE

IT'S THE ELATERITE IN ELAT-A-COTE

Liquid Mineral Rubber

That stops WATER, RUST, ACIDS, ALKALIS and GASES

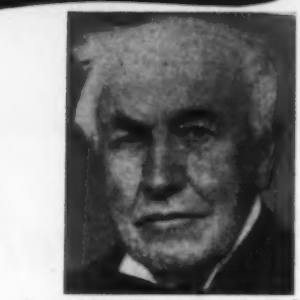
A RUBBER BLANKET ROOFING *that's Trouble-Free!*

IDEALLY adapted to any type roof, Elat-a-Cote offers a roofing that's unequaled! Easily applied cold, Elat-a-Cote forms a mineral rubber blanket that's both adhesive and cohesive. Water-tight and weather-proof, the Elat-a-Cote roof stands up under heat, cold, rain or snow. Non-inflammable. Not affected by acids, alkalis, water or gases. Elastic—absorbs contraction and expansion. Won't run, crack, check or alligator. Can be used for both truck and foot traffic. Elat-a-Cote is inexpensive in both initial cost and upkeep. No nails to rust, no felt to dry up and curl, no painting or resurfacing.

GUARANTEE: We guarantee Elat-a-Cote to have a 62½% elaterite base—to contain no tar, adulterants or injurious chemicals. . . Comes in black, maroon and green.

OTHER ELATERITE PRODUCTS YOU'LL WANT

ELAT-A-PAINTS: Aluminum, Heat Resistant, Acid Resistant • ELAT-A-FLOOR in colors • WATERPROOFING • PLASTER BOND • RUBBER COMPOUND • ELECTRICAL INSULATION.



In 1916 Thomas A. Edison wrote in Scientific American:

Tests of elaterite . . . are disclosing this hydro-carbon . . . as an extremely useful agent in the world of industry rendering services that nothing in nature heretofore was known to perform.

. . . When spread over surfaces of wood, iron, steel, leather, rubber, cork, concrete and tin solvents evaporate, leaving an intensely close-grained, luminous, ebony-black veneer, which is completely poreless . . . acid-, alkali-, water-, electricity-, oxygen- and nitrogen-proof.

. . . Experiments . . . have demonstrated that underground pipes of both wood and metal, when coated with elaterite solution, were not in the least affected by decomposing elements . . . complete prevention of rot and rust having been accomplished.

The permeating of elaterite solution into minutest pores . . . constitutes a series of thread-like supports.

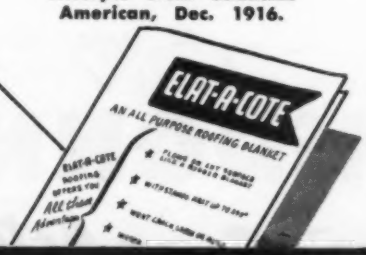
Excerpts from Scientific American, Dec. 1916.

ELATERITE
ELAT-A-COTE ★
LIQUID MINERAL RUBBER

WAREHOUSED IN PRINCIPAL CITIES

Send for FREE *New Folder*

Complete details of Elat-a-Cote Liquid Mineral Rubber Roofing are given in an illustrated folder. Send for your copy today.



ELATERITE NON-METALLIC PRODUCTS CO.

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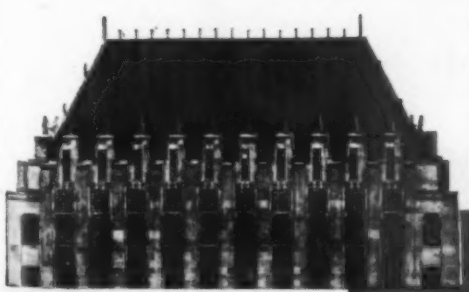
HUSSEY COPPER

Specified for Beauty and Lasting Protection



Hussey Copper roofs and gutters—"*good for a lifetime without upkeep or repair.*"

In your present and future planning remember to specify and use Hussey lifetime Copper Products.

C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
ROLLING MILL AND GENERAL OFFICES: PITTSBURGH, PA.
Warehouses in Principal Cities

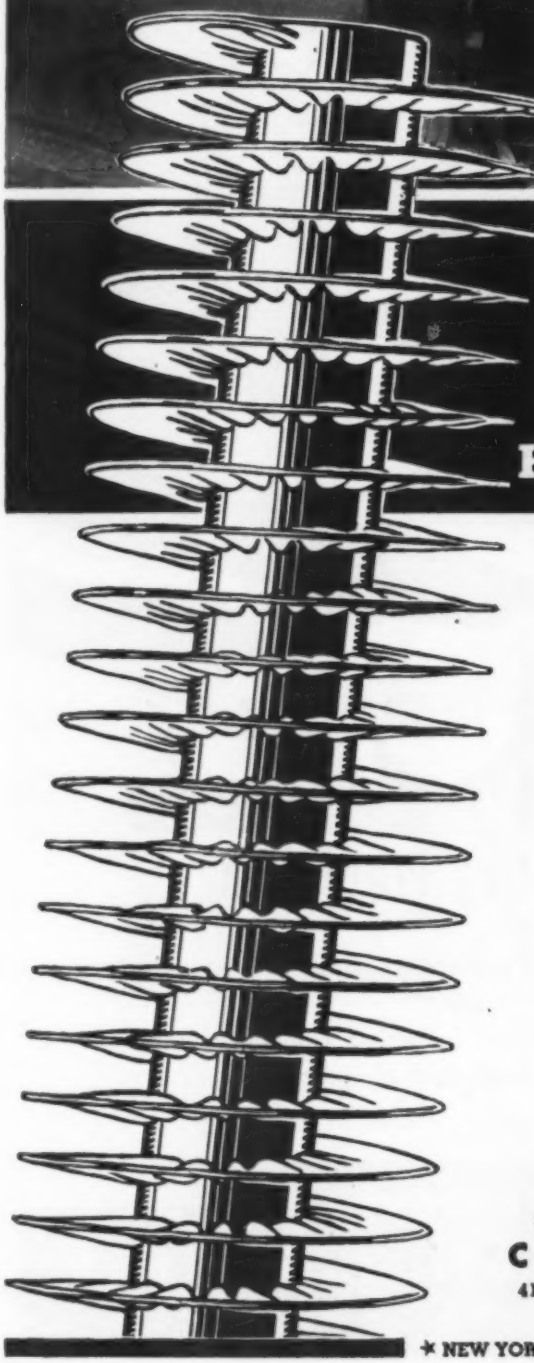
Thousands of Tons of Refrigeration for Air-Conditioning

Photo Courtesy Douglas Aircraft Co., Inc.

Aircraft Plants Specify

AEROFIN

HEAT TRANSFER SURFACE



Aerofin's proved materials and manufacturing methods eliminate breakdowns and reduce servicing.

Aerofin engineering, based on accurate published ratings, fits the right equipment to the job.

Metallic bonding and complete tinning give highest practical heat transfer and protection from corrosion.

Compact, light weight, easy to install.

Standard line of heavy duty coils for unusual applications.

SPECIFIED BY LEADING ENGINEERS
FOR EXCEPTIONAL PERFORMANCE

AEROFIN CORPORATION

416 South Geddes Street, Syracuse, New York

Aerofin is sold only by Manufacturers of Nationally Advertised Fan System Apparatus — List Upon Request —

* NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • TORONTO

WILLIAMSON
PIPE AND FITTINGS

When you Sell a Furnace . . .

Do you Sell

the Pipe and Fittings?

You can if you sell Williamson Pipe and Fittings.

To most of your customers all furnace pipe look alike. But, oh, what a difference you know there is.

Sure, some fittings go together quick. "Easy does it", but the joints are not dust-tight. This means that careful workmanship, precision manufacturing which insures dust-tight joints is important to your customer. Something he wants and thinks he's getting.

It's important to you and doubly important in your Forced Air jobs which is why so many leading heating contractors and dealers specify and buy Williamson Gravity and Favor-Lox Forced Air Pipe and Fittings.

Quality and gauge, precision manufacture and inspection are carefully guarded to insure you and your customer the cleanest and most economical systems.

We believe, if you are not already using Williamson Pipe and Fittings, that you will buy them regularly after you "see for yourself." And, we'll be glad to send you the address of our nearest distributor.

THE
WILLIAMSON
HEATER COMPANY
CINCINNATI 9, OHIO

THE NAME THAT MEANS ECONOMICAL OIL HEAT TO HOME OWNERS AND . . .

Volume Sales to You!

Since 1903—when the founders of this company pioneered the use of oil for heat and power, the name of PETRO has been synonomous with efficient, economical oil heat.

As evidence of this, PETRO alone has put in over 10% of all the oil heating installations in this country, in every type of building from bungalow to skyscraper! It is this preference for PETRO that—in the years to come—assures increased oil burner sales for you long after today's brisk postwar flurry is gone and forgotten.

The new PETRO Oil Heating Equipment includes an attractive, styled-for-eye-appeal line covering the entire capacity range for both "conversion burners" and "units". New features in design insure continued leadership as the best and most economical heating equipment that money can buy.

PETRO Oil Heating Equipment is distributed through established heating supply houses. Write for the name of the one nearest you today!

PETROLEUM HEAT AND POWER COMPANY
STAMFORD, CONNECTICUT

Petro Fuel Oil Bulk plants, distribution terminals and facilities in:
Boston • Providence • Stamford • Mt. Vernon • New York
Long Island • Newark • Philadelphia • Washington • Chicago

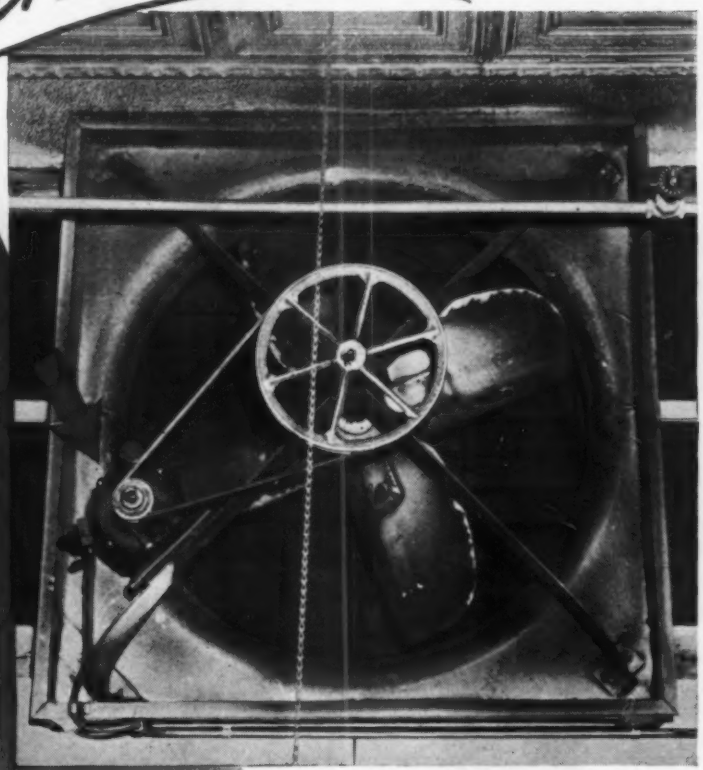
OHI

PETRO
REG. U.S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT SINCE 1903

For Quiet, Comfortable AIR CIRCULATING—

Equip Your Fans and Blowers with CENTURY MOTORS



Century Capacitor Motor provides quiet power for a fan in the Medical Department of an industrial plant.

The quiet starting and the quiet running characteristics of Century Motors make them ideal for all heating, ventilating, and air conditioning equipment. Thousands of installations in hospitals, homes, public buildings, and factories are giving completely satisfactory performance.

Throughout their long life they give the kind of service that adds to the comfort and convenience derived from your equipment.

Century Motors may be a vital factor in your efforts to produce a more satisfactory installation . . . specify Century.

Century Motors are built in sizes from 1/20 to 600 horsepower.

Century C MOTORS

CENTURY ELECTRIC COMPANY, 1806 Pine St., St. Louis 3, Mo.

CE-411

Offices and Stock Points in Principal Cities

Association Activities . . .

SMCNA Annual Convention

The annual convention of the Sheet Metal Contractors National Association, Inc., will be held in St. Louis, Missouri, at the Statler Hotel on May 2, 3, and 4. Plans for this three-day convention were formulated at the recent Board of Directors meeting in Chicago, as follows:

May 2nd:
Morning—Registration. Appointment of Committees.
Noon—Luncheon—Speaker.
Afternoon—Report of officers on the activities of the National Association during the past year and proposed plans for the coming year.
Evening—Open house and entertainment.

May 3rd:
Morning—Labor Relations Program.
Noon—Luncheon.
Afternoon—Forums on the following subjects: Architectural sheet metal work; blow piping; roofing; sheet metal fabrication; ventilating and air-conditioning; warm-air heating.
Evening—Open house and entertainment.

May 4th:
Morning—Speakers on sales promotion and building outlook for 1946.
Noon—Luncheon.
Afternoon—New business. Reports of forum committees. Election of officers.
Evening—Banquet—noted speaker. Installation of new officers. Dancing.

A postal card has been enclosed with the December 26 letter to members, inviting them to inform their secretary if they are interested in architectural sheet metal work, blow piping, roofing, sheet metal fabrication, ventilating and air conditioning, or warm air heating. Forums on these subjects will be a part of the 1946 convention.

Applications for hotel accommodations must be secured from the secretary's office—567 Genesee Street, Buffalo 4, Applications have been prepared in connection with St. Louis Housing Authorities, who have charge of all hotel reservations. No reservation will be made for any convention in the City of St. Louis, unless it clears through their office on the official form used.

Clarence J. Meyer, National Secretary.

THIS IS TO CERTIFY THAT
IS A DEALER MEMBER OF THE
NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
FOR THE YEAR
1946

The dealer membership certificate of the National Warm Air Heating and Air Conditioning Association, 145 Public Square, Cleveland 14. Dealer members will receive these certificates as rapidly as the artist can inscribe their names.

◆

Cook County, Illinois

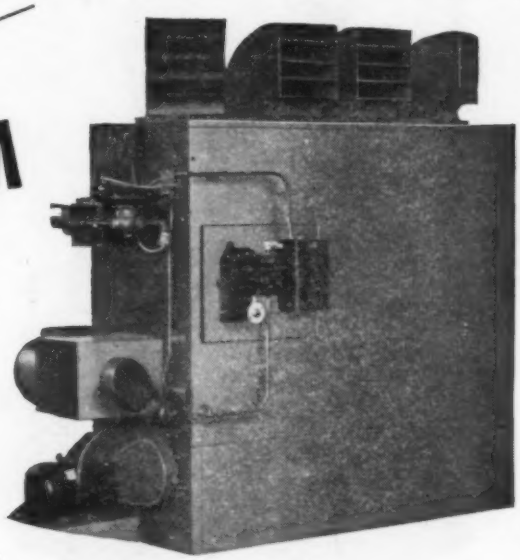
Sheet Metal Contractors Association of Cook County held their regular monthly meeting on Wednesday, January 16, 1946, with a luncheon meeting at the Builders Club at 228 N. LaSalle Street, Chicago, Illinois.

Meeting adjourned at 2:30 p.m. The next meeting to be held at the same place on the third Wednesday of February.—Wm. J. Perkinson, Chairman Publicity Committee.

◆

Carolinas

New members reported in the December issue of "The Carolinas Roofer" are: H. E. Wilson, Wilson Roofing & Siding Co., Box 668, Washington, N. C. Chas. E. Floyd, Greenville Roofing Co., Box 161, Greenville, S. C.



THE new Airtherm Space Heater provides an even distribution of heat to all parts of the building through high velocity nozzles — is installed with a minimum of installation costs and requires practically no maintenance.

The new Airtherm Space Heater is available in 3 models — for floor mounting (as illustrated) or horizontal or vertical suspension. Choice of gas or oil burners on all models. Capacities from 650,000 to 1,950,000 BTU's per hour.

Write for bulletin describing this new, efficient, money-saving heater, in detail.

AIRTHERM
MANUFACTURING COMPANY
706 S. Spring Avenue • St. Louis 10, Missouri

Here's the Lift You Need to Hit the Top in Oil Heat Sales

There's nothing hit-or-miss about the Fluid Heat way of helping dealers build sales. Our ideas and methods are backed by practical experience that dates from the beginning of the oil heating business—and have paid off to our dealers for years. Here are a few ideas of what it means to be a Fluid Heat Dealer:

1. You have the assistance of an active field force . . . of men who can help you on any problem of oil heating installation, operation, service or sales.

2. You have a trade-mark that insures consumer acceptance and dependable performance . . . many Fluid Heat Burners are still on the job after 17 to 20 years of use.

3. You have behind you a company that has built its oil heating business by helping dealers build theirs . . . and whose products have given satisfaction to home owners for more than half a century.

4. You have a really complete line . . . engineered and built to reduce service problems to a minimum and build sales through customer satisfaction.

5. You sell products that are *kept ahead* of all competition . . . through constant development work by one of the largest engineering staffs in the industry.

Fluid Heat is ready to work with you now...so get full facts about a Fluid Heat franchise. No cost. No obligation. Fluid Heat Division, Anchor Post Fence Co., 6720 Eastern Ave., Baltimore 24, Maryland.

fluid heat
PRODUCTS

"WORLD'S ECONOMY CHAMPION"

Manufactured by the Anchor Post Fence Company, Baltimore, Md., Established 1892

Want More Fuel Oil Sales? Some of the most successful companies in the fuel oil business find that selling the kind of burners we make, with the kind of help we give them, builds and holds more fuel oil business. Write to us. We think we can help you make more money.

4 Pressure Burners
Firing rates from 7/10 to 12 gallons per hour

6 Vertical Rotary Burners
Firing rates from 7/10 to 6 gallons per hour

8 Air Conditioning Furnaces
From 70,000 to 200,000 BTU per hour

7 Boiler Burner Units
Capacities from 475 to 840 sq. ft. of standing hot water

40 Gal. Hot Water Heater
Sells on appearance —delights users by performance

CATSKILL

spells profits

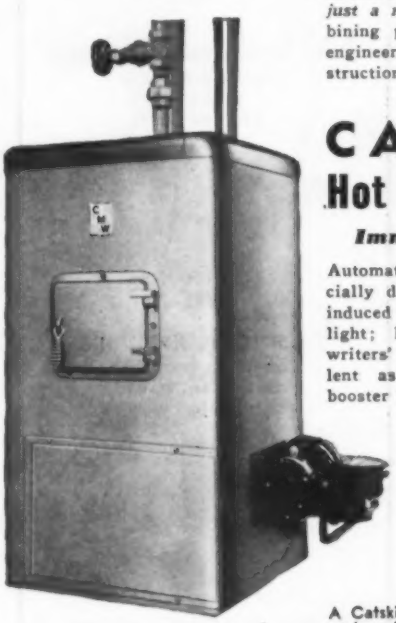
WITH THESE 2 GREAT

OIL HEAT UNITS

CATSKILL Oil Burner

For the BIG conversion market. A low-cost unit for changing-over still serviceable heating plants to oil heat. No meaningless "gadgets" featured as "sales bait." Offered as *just a real good oil burner*, combining practical design, precision engineering, highest grade construction throughout.

Catskill CMW dealerships still open in many localities. Write for our proposition.



CATSKILL Hot Water Maker

Immediate Delivery

Automatic—instant hot water. Specially designed for oil fuel. Air-induced mechanical draft; easy to light; low pilot flame; Underwriters' approval seal. Also excellent as garage heater or heat booster for small shops.

A Catskill CMW franchise can mean real profits for you in '46. Write today for full details of our exclusive dealer plan.

CMW

CATSKILL METAL WORKS, INC.

CATSKILL, NEW YORK

ONE OF THE LARGEST PRODUCERS OF ANTHRACITE STOKERS

Association Activities . . .

Illinois

The Sheet Metal Contractors Association of Illinois will hold the annual convention at the Jefferson Hotel, Peoria, Illinois, on April 8th and 9th, 1946.

This is the first convention since the close of the great war which required all of our time and effort to bring victory. Many problems confront us and the need for a convention for acquiring as much knowledge as possible of the many new techniques in metal working and heating are imperative.

We are proud to say our officers have kept up the association work and our paid memberships are very gratifying.

W. R. Shaw, Secretary.

◆

New York State

The January 11 bulletin of the New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., announces a full scale convention to be held at the Hotel Statler, Buffalo, on April 2 and 3.

The Merchandisers, the auxiliary, will hold "Open House" on the first night of the convention. The banquet with entertainment and dancing will be held on the second night.

Joseph Stiglmeier, president of the Buffalo Chapter, and general chairman of the 1946 convention, promises a program well worth the attendance of every member. Full details of the two-day meeting will be released in the next bulletin. Members are urged to send their reservations to the Hotel Statler at once.

At the last directors' meeting in Syracuse, the following resolutions were adopted, and ordered sent to proper persons and firms:

Resolution No. 1

WHEREAS, the Legislature of the State of New York has recently amended the Workmen's Compensation Law to provide for so called "Second Injury" cases, and

WHEREAS, this is only a short step in the right direction as it still burdens the employer with the greater part of the burden of providing death benefits, hospital, and medical costs, and compensation for injuries and deaths occurring to handicapped veterans and workers, and

WHEREAS, the lack of a fair and reasonable protection to the employer of handicapped veterans, and partially disabled workers is preventing the employment of hundreds, if not thousands, of such handicapped veterans and workers because the greater part of the cost for such injuries must still be paid by the employers

THEREFORE, BE IT RESOLVED, by the New York State Association of Sheet Metal, Roofing and Air Conditioning Contractors that the Governor of the State be urged to recommend to the legislature such amendments to the Workmen's Compensation Laws as may be necessary to furnish full relief to the employers of such veterans and handicapped workers. and

BE IT FURTHER RESOLVED, that the Legislature at its next session be urged to amend the law so that injuries or deaths resulting from the employment of such handicapped, or partially disabled veterans or workers, when such injuries or deaths are due, wholly or in part, to such previous handicaps or injuries, shall be paid entirely from funds provided by the State such as those now set up for the relief of so called "second injury" cases.

Resolution No. 2

RESOLVED, that the manufacturers of roofing materials standardize on containers for Bituminous Products to contain 250 lb. or less.

It is our experience, to date, that the filling of pitch, asphalt, etc., in heavy drums running 450 lb. to 600 lb. has caused contractors extra cost of labor in handling, and is also causing our insurance accidents to rise, especially in strain and back cases, etc.

We suggest that steep asphalt be packed in 100 lb. cartons. Pitch and low melting point asphalt be packed in no heavier a drum than 250 lb. or even standardized to less, preferably steel containers.

You are requested to follow these resolutions through.

Resolution No. 1 was sent to Governor Thomas E. Dewey, and to the Senate and Assembly Majority and Minority Leader. Contact your local Senators and Assemblymen, at once, and help the cause along.

Resolution No. 2 was sent to all leading manufacturers of tar, pitch, and asphalt materials. Contact your suppliers of these products, and the representatives who call on you, letting them know that you are interested.

Clarence J. Meyer, State Secretary.

◆

FRONT RANK
Always Out FRONT!

...IF IT'S A WINTER AIR CONDITIONING UNIT

...you can't beat this FRONT RANK, compactly designed Unit. Circulates a generous supply of conditioned warm air throughout the house—including those "hard to heat" rooms. Dustop Air Filters catch the dust and dirt. Automatically controlled Blower operates only when furnace and casing are hot. Finished in beautiful green enamel.

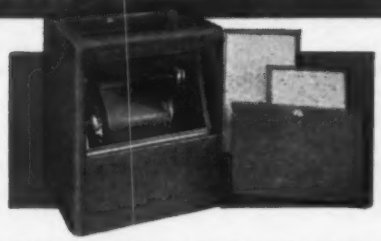
..IF IT'S A WINTER AIR-CONDITIONING UNIT for Stoker Firing...

This compact FRONT RANK Unit is highly recommended. Large door in front of casing leads to a vestibule holding a heavy gauge clinker container. May be emptied when necessary.

IF IT'S A WARM AIR FURNACE...A STOKER...OR A BLOWER-FILTER UNIT—SELL FRONT RANK

FRONT RANK Warm Air Furnaces are superior in design to meet present-day demands for heavy duty and economy. These Furnaces are the Line for Bigger Profits.

This FRONT RANK Oil Burning Furnace—automatic oil heat combined with winter air-conditioning—is far "out in front" in design, efficiency and beauty.



For circulating cleansed air through the house, this FRONT RANK Blower-Filter Unit is tops! Filters out dust and dirt. Compactly designed it may be added to an old furnace.

Like all FRONT RANK Heating Appliances, this Stoker is a high quality unit throughout. Efficient in operation and mechanically superior—to appeal to discriminating owners.

BE FIRST IN SALES..WITH FRONT RANK

FRONT RANK FURNACE CO. 2500 Ohio Ave. St. Louis 4, Mo.

Association Activities . . .

Cook County

The Sheet Metal Contractors Association of Cook County held a meeting on Wednesday noon, December 19th, at the Builders Club, 228 North La Salle Street, Chicago.

Officers for the year of 1946 were elected as follows:

L. V. Burghoffer (Luse-Stenson Co.), President.
G. P. Meyers (Meyers Brothers), Vice President.
Ed Nelson (Nelson Brothers), Secretary.
Albert Wagner, Jr. (Albert Wagner & Son), Treasurer.

The new officers have some very progressive plans for the new year.

Arrangements are being made whereby members will be kept advised as to the activities.

With best wishes for a Merry Christmas and a Happy New Year.—Wm. J. Perkinson.

◆

New York City

At the December 6 meeting of the Roofing and Sheet Metal Crafts Institute, the following officers were elected:

President—Irving Popik.

Vice Presidents—Albert F. Neuscheler of A. C. Gmelin, Inc.; Charles Muller, Brooklyn; Martin J. Hale, M. Barry Roofing Co.

Treasurer—Irving Koppelson, N. Koppelson & Son.

Recording Secretary—Albert L. Lauber, A. Lauber's Sons.

Sgt.-at-Arms—Cornelius Muller, Rudolph E. H. Muller Sons.

Corresponding Secretary—Eugene L. Packer.

Chairman of the Board of Directors—Lawrence C. Corvi, Greenwich Roofing Works.

Thomas J. Wynne, former chairman of the board was elected a member of that body for a term of three years, along with Louis Moskowitz.

The Roofing and Sheet Metal Crafts Institute went through the most active year in its history. Despite handicaps due to war time conditions, the organization continued to show progress. Membership has been increasing steadily and its influence widespread.

The Institute is making an effort to inaugurate and maintain a new department dealing with the employment of new help. In its desire to extend some little extra service to discharged war veterans and at the same time help firms in the trade make contact with these men, the Institute hopes to publish a monthly column listing the names, addresses and possible details about the past experience of men who desire to take up this kind of work. Negotiations have been started with several government agencies to secure the name of the men.

Obituary

Ernest C. Fox, organizer of the old Fox Furnace Company, and founder and chairman of the board of the **Independent Register Company**, 3747 E. 93rd Street, Cleveland 5, died at his home—2344 Ardleigh Drive, Cleveland Heights—on December 20.

Mr. Fox was born in the Crawford-Hough Avenue district 75 years ago. His parents had been pioneer Clevelanders.

E. C. Fox launched his furnace heating enterprise in the '90s, but sold the business just prior to the founding of the register company in 1898. He continued as president of the Independent Register Company until two years ago when he turned this post over to his son-in-law, Bruce Richardson. He had been in ill health for four years, but remained active as board chairman.

Survivors are his wife and two daughters—Margaret and Mrs. Bruce Richardson.

Blo-Fan
CEILING VENTILATOR

Combination Fan and Blower

BLO-FAN is modern! It provides the kind of ventilation your customers will insist upon — UP — *directly over the source.*

Just "a fan" no longer will satisfy Mr. and Mrs. Homeowner. They know too much about ventilation to have any other type than nature's way.

Blo-Fan "Spot" Ventilators are a patented combination of fan and blower principles with an outstanding prewar sales record. They provide the *volume* of a propeller fan with the *power* of a blower *at the point where foul air originates* . . . There is nothing comparable.

You'll find a ready demand for Blo-Fans in your neighborhood. And there's a franchised distributor close at hand to serve you.

How Blo-Fan Captures Grease and Smoke as They Rise

PRYNE & CO., INC.
LOS ANGELES 54, CALIFORNIA
BRANCHES:
NEW YORK · CHICAGO · HOUSTON · SAN FRANCISCO

THERE'S A FRANCHISED BLO-FAN DISTRIBUTOR NEAR YOU

ARIZONA
PHOENIX – Arizona Wholesale Electric Co. • General Electric Supply Corp. • Graybar Electric Co. Westinghouse Electric Supply Co.
TUCSON – Albert Steinfeld & Co. • Tucson Electric Supply Co.

ARKANSAS
LITTLE ROCK – F. C. Stearns Hardware Co.

CALIFORNIA
ALHAMBRA – Courtesy Wholesale Electric Co.
BAKERSFIELD – Mongerson Electrical Machine Works
FRESNO – Electrical Suppliers • General Electric Supply Corp. • Incandescent Supply Co.
HUNTINGTON PARK – J-Z Wholesale Electric Co.
INGLEWOOD – Taylor Wholesale Electric Co.
LONG BEACH – Gaines Electric Supply Co. L. B. Marsh
LOS ANGELES – American Wholesale Electric Co. Associated Wholesale Electric Co. • Brown Wholesale Electric Co. • California Wholesale Electric Co. • Electric Corporation • Electrical Contractors' Supply Co. • Electric Distributors, Inc. • Electric Wholesale Supply Co., Inc. • General Electric Supply Corp. • Gough Industries, Inc. • Graham-Reynolds Electric Co. • Graybar Electric Co. Hollywood Wholesale Electric Co. • Incandescent Supply Co. • Industrial Wholesale Electric Co. Ladco Wholesale Electric Co. • Los Angeles Wholesale Electric Co. • Modern Wholesale Electric Co. National Wholesale Electric Co. • Osipow Electric Supply Co. • Standard Wholesale Electric Co. Westinghouse Electric Supply Co.
MODESTO – Wille Electric Supply Co.
OAKLAND – Electric Corporation • General Electric Supply Corp. • Gilson Supply Co. • Graybar Electric Co., Inc. • Incandescent Supply Co. • State Electric Supply Co. • Westinghouse Electric Supply Co.
PASADENA – Cook-Nichols Co.
SACRAMENTO – Capitol Wholesale Electric Co. General Electric Supply Corp. • Graybar Electric Co., Inc. • Thomson-Diggs Co. • Valley Electric Co.
SAN FRANCISCO – California Electric Supply Co. Crescent Electric Co. • Electric Corporation General Electric Supply Corp. • Graybar Electric Co., Inc. • Gray Electric Supply Co. Incandescent Supply Co. • Jobbers Electric Co. National Electric Supply Co. • Phillips & Edwards Electric Co. • San Francisco Lighting & Supply Co. Westinghouse Electric Supply Co.
SAN DIEGO – Coast Electric Co. • Electric Supplies Distributing Co. • Pacific Wholesale Electric Co.
SAN JOSE – Buckles-Smith Co. • Service Electric Co.
SANTA ANA – Orange County Wholesale Electric Co. L. B. Marsh
SANTA ROSA – Jobbers Electric Co. • National Electric Supply Co.
STOCKTON – Austin Brothers • Valley Electric Co.

COLORADO
DENVER – Central Electric Supply Co. • General Electric Supply Corp.

CONNECTICUT
BRIDGEPORT – Olschan Electric Supply Co.
HARTFORD – Beacon Light & Supply Co. • Economy Electric Supply Co.
NEW BRITAIN – Spring & Buckley, Inc.
NEW HAVEN – Grand Light & Supply Co.
STAMFORD – MarLo Co.

DELAWARE
WILMINGTON – Artcraft Electric Supply Co.

DISTRICT OF COLUMBIA
WASHINGTON – Columbia Electric Supply Co., Inc. Fries, Beall & Sharp Co. • General Electric Supply Corp.

FLORIDA
DAYTONA BEACH – Hughes Supply Co.
GAINESVILLE – Baird Hardware Co.
JACKSONVILLE – General Electric Supply Corp. Hajoca Corp. • Raybro Electric Co.
MIAMI – General Electric Supply Corp. • McDonald Electric Co., Inc. • Raybro Electric Co.
ORLANDO – Hughes Electrical Supply Co.
TAMPA – General Electric Supply Corp. Raybro Electric Co.

GEORGIA
ATLANTA – Economy Electric Supply Co. • General Electric Supply Corp.
AUGUSTA – Hart Electric Supply Co.
COLUMBUS – P & W Electric Supply Co.
MACON – Lowe Electric Co.
SAVANNAH – General Electric Supply Corp.

IDAHO
BOISE – General Electric Supply Corp.

ILLINOIS
AURORA – Schomer Electric Supply Co.
CENTRALIA – The Travelectric Co.
CHICAGO – General Electric Supply Corp. • Emjay Supply Co. • Revere Electric Supply Co.
DANVILLE – Danville Electric Supply Co.
ELGIN – Fox Electric Supply Co.
JOLIET – Barrett Hardware Co.
PEORIA – Kiefer Electric Supply Co.
QUINCY – Crescent Electric Supply Co.
ROCKFORD – General Electric Supply Corp. Rock River Electrical Supply Co.
SPRINGFIELD – General Electric Supply Corp.

INDIANA
ANDERSON – Peerless Electric Supply Co.
EVANSVILLE – General Electric Supply Corp.
FT. WAYNE – National Mill Supply Co.
GOSHEN – Goshen Electric Supply Co.
INDIANAPOLIS – General Electric Supply Corp. Peerless Electric Supply Co.
KOKOMO – Wholesale Electric Service
LAFAYETTE – Kirby Risk Electric Co.
MARION – Universal Electric Co.
MUNCIE – General Electric Supply Corp. Universal Electric Co.
SOUTH BEND – South Bend Electric Co.
TERRE HAUTE – Walker Electric Supply Co.

IOWA
BURLINGTON – Crescent Electric Supply Co.
CEDAR RAPIDS – Van Meter Co.
DAVENPORT – Crescent Electric Supply Co.
DES MOINES – General Electric Supply Corp.
DUBUQUE – Crescent Electric Supply Co.
FORT DODGE – Iowa Electric Supply Co., Inc.
MASON CITY – Crescent Electric Supply Co.
SIOUX CITY – Crescent Electric Supply Co.
WATERLOO – Crescent Electric Supply Co.

KANSAS
KANSAS CITY – W. T. Foley Electric Co.
SALINA – Lee Hardware Co.
TOPEKA – Kansas Electric Co.
WICHITA – America Electric Co. • General Electric Supply Corp.

KENTUCKY
LEXINGTON – General Electric Supply Corp.
LOUISVILLE – General Electric Supply Corp.

LOUISIANA
BATON ROUGE – Electrical Wholesalers, Inc.
MONROE – Monroe Hardware Co.
NEW ORLEANS – General Electric Supply Corp. Lighting Fixture & Electric Supply Co.
SHREVEPORT – General Electric Supply Corp. Monroe Hardware Co.

MAINE
BANGOR – General Electric Supply Corp.
PORTLAND – General Electric Supply Corp.

MARYLAND
BALTIMORE – Dorman Electric Supply Co. Excello Public Service Corp. General Electric Supply Corp.

MASSACHUSETTS
BOSTON – General Electric Supply Corp.
FALL RIVER – Brady Electric Supply Co.
FITCHBURG – Service Electric Supply, Inc.
LAWRENCE – Dyer-Clark Co.
LYNNE – Essex Electric Supply Co.
NEW BEDFORD – Electric Service & Sales Co.
QUINCY – Granite City Electric Supply Co.
SPRINGFIELD – Carlisle Hardware Co. General Electric Supply Corp.
WATERTOWN – Watertown Electric Supply Co.
WORCESTER – Atlantic Electric Supply Co., Inc. A. C. Bowler Co. • General Electric Supply Corp.

MICHIGAN
BATTLE CREEK – Central Electric Supply Co.
BAY CITY – Meisel Hardware & Supply Co.
DETROIT – General Electric Supply Corp. Madison Electric Co.
FLINT – Royalite Co.
GRAND RAPIDS – General Electric Supply Corp.
KALAMAZOO – General Electric Supply Corp.
LANSING – General Electric Supply Corp. Michigan Brass & Electric Co., Inc.
MUSKEGON – Fitzpatrick Electric Supply Co.
PONTIAC – Standard Electric Co.
SAGINAW – General Electric Supply Corp. Morley Brothers

MINNESOTA
MINNEAPOLIS – Northland Electric Supply Co. Sterling Electric Co.
ST. PAUL – Electric Supply Co. • Farwell, Ozmun, Kirk & Co. • General Electric Supply Corp.

MISSISSIPPI
JACKSON – Electric Supply Co. General Electric Supply Corp.

MISSOURI
JOPLIN – General Electric Supply Corp.
KANSAS CITY – General Electric Supply Corp.
ST. JOSEPH – American Electric Co.
ST. LOUIS – General Electric Supply Corp.

MONTANA
BUTTE – General Electric Supply Corp.

NEBRASKA
CHADRON – Casper Supply Co.
LINCOLN – The Korsmeyer Co.
OMAHA – General Electric Supply Corp.
SCOTTSBLUFF – Casper Supply Co.

NEW HAMPSHIRE
MANCHESTER – Granite State Electric Supply Co.

NEW JERSEY
BLOOMFIELD – Bloomfield Electric Supply Co.
CAMDEN – Borstein Electric Co.
ELIZABETH – Jersey State Electric Co., Inc.
HACKENSACK – Lowenthal Electric Supply Co.
HOBOKEN – L. & G. Laikin
MORRISTOWN – Morristown Electrical Supply Co.
NEWARK – Reliable Electric Supply Co. Star Electrical Supply Co.
NEW BRUNSWICK – New Brunswick Electric Supply Co.
ORANGE – C. M. Lantz
PASSAIC – National Electric Co.
PATERSON – Watson-Flagg Sales Corp. White & Shanger, Inc.
TRENTON – Griffith Electric Supply Co.
UNION CITY – Hudson Electric Supply Co.

NEW YORK
ALBANY – Havens Electric Co., Inc.
BINGHAMPTON – Wehle Electric Co., Inc.
BROOKLYN – G. M. Ketcham Mfg. Corp. General Electric Supply Corp.
BUFFALO – Davis Electrical Supply Co. • General Electric Supply Corp. • Kenmore Builders Supply Co., Inc. • Wehle Electric Co., Inc.
ELMIRA – Wehle Electric Co., Inc.
GLENS FALLS – Glens Falls Electric Supply Co.
ITHACA – Stallman of Ithaca
JAMAICA – Central Queens Lighting Fixture Corp.
KINGSTON – Kolts Electric Supply Co.
MT. VERNON – B. Davis • P G Supply Co.
NEW YORK – General Electric Supply Corp. Hirschfeld Electric Supply Co.
NIAGARA FALLS – General Electric Supply Corp.
OLEAN – LeValley-McLeod-Kinkaid Co., Inc.
POUGHKEEPSIE – Electra Supply Co., Inc.
ROCHESTER – S. A. Spencer Wehle Electric Co., Inc.
SYRACUSE – Gould Farmer Co., Inc. Edward Jay Co.
YONKERS – Galer Electric Supply Co.

NORTH CAROLINA
CHARLOTTE – General Electric Supply Corp.

NORTH DAKOTA
FARGO – Dakota Electric Supply Co.
MINOT – Dakota Electric Supply Co.

OHIO
AKRON – General Electric Supply Corp. Sacks Electrical Supply Co.
CANTON – General Electric Supply Corp. The Furbay Sommer Co.
CINCINNATI – General Electric Supply Corp. Richards Electric Supply Co.
CLEVELAND – General Electric Supply Corp. Midland Electric Co.
COLUMBUS – General Electric Supply Corp.
DAYTON – General Electric Supply Corp.
MANSFIELD – Hartman-Spreng Co.
TOLEDO – Anderson & Kropp General Electric Supply Corp.
YOUNGSTOWN – General Electric Supply Corp. Hood Electric Co.

OKLAHOMA
OKLAHOMA CITY – General Electric Supply Corp.
TULSA – General Electric Supply Corp.

OREGON
EUGENE – Eoff Electric Co. • Gilbert Brothers, Inc. C. P. Tillman Co.
PORTLAND – Brod & McClung • Central Supply Co. Chown Electric Supply Co. • General Electric Supply Corp. • Gilbert Brothers, Inc. • North Coast Electric Co. • Stubbs Electric Co. • Westinghouse Electric Supply Co.
SALEM – Eoff Electric Co. • Gilbert Brothers, Inc.

PENNSYLVANIA
BRADFORD – Booth Electric Co.
CHESTER – Roddington Electric Co.
ERIE – General Electric Supply Corp.
HARRISBURG – Dauphin Electrical Supplies Co.
LANCASTER – Jno. E. Graybill & Co.
MEADVILLE – Harley D. Carpenter
NEW CASTLE – Bruce Electric Supply Co.
OIL CITY – Corrin Electric Supply
PHILADELPHIA – Taylor Albertson Co. • Broad Electric Supply Co. • General Electric Supply Corp. West Philadelphia Electric Supply Co.
PITTSBURGH – L. Paul O'Hara
WEST CHESTER – West Chester Electric Supply Co.
YORK – Jno. E. Graybill & Co.

RHODE ISLAND
PROVIDENCE – General Electric Supply Corp. Royal Electric Supply Co.

SOUTH CAROLINA
SUMTER – Sumter Machinery Co., Inc.

SOUTH DAKOTA
RAPID CITY – Casper Supply Co.
SIOUX FALLS – Crescent Electric Supply Co.

TENNESSEE
CHATTANOOGA – Ramsey Electric Supply Co.
NASHVILLE – General Electric Supply Corp. Harris-Patrick Electric Supply Co.

TEXAS
ABILENE – General Electric Supply Corp.
AMARILLO – General Electric Supply Corp.
AUSTIN – Southern Electric Supply Co.
CORPUS CHRISTI – Corpus Christi Hardware Co.
DALLAS – General Electric Supply Corp. Smith-Perry Electric Co.
EL PASO – General Electric Supply Corp.
FORT WORTH – General Electric Supply Corp. Smith-Perry Electric Co.
HARLINGEN – Bush Supply Co.
HOUSTON – General Electric Supply Corp. • Southern Electric Supply Co. • Warren Electric Co.
LUBBOCK – Southwestern Electric Supply Co.
SAN ANTONIO – General Electric Supply Corp. Southern Equipment Co.
WACO – General Electric Supply Corp.

UTAH
SALT LAKE – General Electric Supply Corp. United Electric Supply Co. Westinghouse Electric Supply Co.

VIRGINIA
NORFOLK – General Electric Supply Corp.
RICHMOND – General Electric Supply Corp.

WASHINGTON
SEATTLE – Bean Electric Co. • General Electric Supply Corp. • Gilbert Brothers, Inc. • Globe Electric Co. • Stusser Electric Co. • Westinghouse Electric Supply Co., Inc.
SPOKANE – Columbia Electric & Mfg. Co. • General Electric Supply Corp. • Inland Electric Co. Westinghouse Electric Supply Co., Inc.
TACOMA – Graybar Electric Co., Inc. Home Electric Co. • Love Electric Co. Westinghouse Electric Supply Co., Inc.

WISCONSIN
APPLETON – General Electric Supply Corp.
FOND du LAC – Central Electric Supply Co.
GREEN BAY – Morley-Murphy Co.
MADISON – Crescent Electric Supply Co.
MANTIOWOC – Rahr Supply Co.
MILWAUKEE – Builders Specialties, Inc. General Electric Supply Corp.
OSHKOSH – Electrical Contractors Supply Co.
SHEBOYGAN – Honold & La Page, Inc.

WYOMING
CASPER – Casper Supply Co.
CHEYENNE – Casper Supply Co.
LARAMIE – Casper Supply Co.
SHERIDAN – Casper Supply Co.
WORLAND – Casper Supply Co.

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★ A COMPLETE LINE ★ ENGINEERING LEADERSHIP
★ YEARS OF EXPERIENCE ★ FINANCIAL STRENGTH
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What about the policies . . . the "know-how" . . . the integrity and stability of the company behind the stoker? These are all-important *plus-values*, and the very success or failure of your stoker selling may well depend on them! That's why we urge you to give yourself the competitive advantage of Freeman's established leadership . . . to strengthen your own business with the same vital assets which have helped make Freeman strong. Get the facts now. See how Freeman offers you a complete line up to 1200 pounds per hour . . . sound engineering backed by research and testing . . . years of experience dating back to the pioneer days of the industry . . . the security and protection of a financially strong manufacturer . . . the unequalled service and cooperation of the foremost plumbing and heating distributors in the country . . . aggressive promotion, including an expanding program of national advertising and dealer helps!

FREEMAN STOKER DIVISION
ILLINOIS IRON & BOLT CO.
918 S. MICHIGAN AVENUE, CHICAGO 5, ILLINOIS

Association Activities . . .

Forced Warm Air Conference

The annual four day Forced Warm Air Conference—the fifteenth—is back again this March at Michigan State College, East Lansing, Michigan. Last year the conference had to be cancelled because of wartime school and convention restrictions but this year the program will be better than ever before.

It will be necessary to restrict attendance at the conference this year. Be sure to register early by mail by writing to Professor L. G. Miller, Michigan State College, Room 111, Olds Hall, East Lansing, Michigan.

THE COST

Course Fee Labortory Fee.....$10.00

Overnight accommodations may be secured in East Lansing homes at approximately $1.50 to $2 per person per night. Those wishing hotel accommodations should reserve them by writing to Hotel Olds, Hotel Roosevelt, or Hotel Porter, Lansing.

Everyone is asked to provide himself with triangles and scale.

THE PROGRAM

The Fifteenth Annual Forced Warm Air Conference, Room 111, Olds Hall of Engineering, Michigan State College.

MONDAY, MARCH 18

9:30—Registration.
10:00—Introduction of General Chairman—L. G. Miller. General Chairman, Ed Root.
10:30—Derivation and Meaning of U Factors for Building Materials—Prof. E. A. Allcut, University of Toronto.
Luncheon.
1:30- 3:00—The National Warm Air Publications and Their Use—Prof. S. Konzo, University of Illinois.
3:00- 4:00—How to Make a Comfort Survey—W. D. Redrup.
4:00- 5:00—Check Frame House Construction—B. F. McLouth.
6:30—Joint Dinner Meeting with Western Michigan Chapter, ASH&VE.
Toastmaster.
Speaker, H. D. Coates, vice-president Motor Wheel Corp., "The Development of the Vaporizing Type Burner."

TUESDAY, MARCH 19

8:30—Heat Loss Sheet—Robert Champlin.
9:00—Group will separate by choice into:
Group I, The 1946 Problem House—Grandstaff. Calculating Its Heat Loss—Bishop; or
Group II, The Problem, a Building Heated Intermittently—Ross Wallis Estimating the Heat Loss from Public Structures.
11:00—Location and Sizing of Registers and Grilles for Gravity Systems—John Norris.
Luncheon.
1:30—Group I, The Gravity Code—Fred Bishop. Design of a Gravity System—Staff.
Group II, Location of Registers and Grilles—L. G. Miller. System Layout and Design—Ward Brundage.
Dinner.
7:30—An Evening in the Laboratory—Professors Campbell and Pesterfield.

WEDNESDAY, MARCH 20

8:30—Groups together. Bulletin No. 7, Forced Warm Air Heat. Systems—Guy Voorhees.
9:30—Location and Sizing of Registers and Grilles for Forced Systems—John Norris.
10:00-12:00—Groups separate and work on problems.
Luncheon.
1:30—Groups separate. Complete Design of Forced Warm Air Systems.
6:30—Dinner. Speaker, Prof. King, Syracuse Universtiy.

THURSDAY, MARCH 21

9:00—Selection of Furnaces and Blowers—A. P. Kratz.
11:00—Controls, What to Expect—C. W. Nessell.
Luncheon.
1:30—What to Expect From Panel Heating Competition—H. S. Randolph, International Heating Co.
Servicing Controls — Service Manager — White — Rodgers.

◆

St. Louis

The Associated Sheet Metal Air Conditioning and Heating Contractors of St. Louis, has elected new officers for 1946, as follows:

Ed. Hasler, President
Thad Pieper, Vice President
Louis Otten, Secretary
Ben Kolbenschlag, Treasurer
Paul Johnson, Sgt. at Arms
A. A. Cuneo, Sgt. at Arms

Our installation banquet will be held Saturday, February 9th, at 7 p. m., at the De Soto Hotel.

Please address all communications to the new secretary, Louis J. Otten, at his business office, 2803 Blair Ave., St. Louis 7, Mo.

A Recognized Standard of Control Excellence...

■ Perfex exclusive Twin Contact switching mechanism gives you these unequaled advantages:

Positive Contact eliminates overheating, sticking or pitting . . . *Magnetic Acceleration* closes contacts by snap action . . . *Lever Action* opens contacts faster and surer . . . *Wiping Action* keeps contacts permanently clean . . . *No Flexible Leads* to impede free action . . . *Immune to Vibration* even under severe conditions . . . *Mountable in Any Position* for easier installation.

In ever increasing numbers, the leading manufacturers of automatic heating systems are turning to *Twin Contact Controls* for positive operation and freedom from service . . . proof they are recognized by the industry as a standard of control excellence.

TWIN CONTACT CONTROLS

PERFEX CORPORATION • MILWAUKEE 7, WISCONSIN

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE-MARK NAMES OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

We Claim This Work!

(*Continued from page 105*)

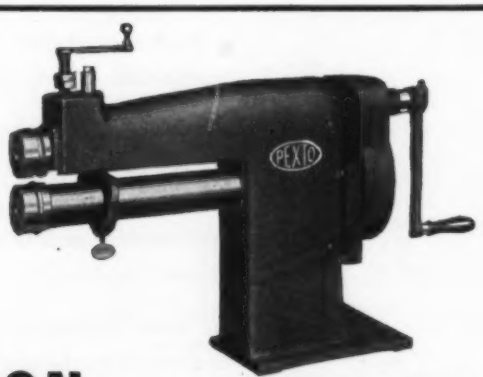
including smokestacks, life rafts, life buoys, crows' nests, bulkheads, telegraph and speaking tubes, switch and cutout boxes, lagging on boilers and engines, lining of all partitions, paint and lamp lockers, refrigerating compartments, battery compartments, galleys and shower baths, ventilation and kitchen equipment.

Section 25. Railroad shopmen shall include sheet metal workers (tinners), coppersmiths and pipefitters employed in shop, yards and buildings and on passenger coaches and engines of all kinds, skilled in the building, erecting, assembling, installing, dismantling and maintaining parts made of sheet copper, brass, tin, zinc, white metal and lead, black planished, galvanized and pickled iron of No. Ten (10) U. S., its equivalent or lighter gauge, including brazing, soldering, tinning, leading and babbitting, the bending, fitting, cutting, threading, brazing, clamping, and testing, connecting and disconnecting of air, water, sand, gas, oil and steam pipes, and the operation of babbitt fires and pipe threading machines, oxy-acetylene, thermit and electric welding on work generally recognized as belonging to railroad shopmen. This jurisdiction includes the work performed in the Maintenance of Equipment, Maintenance of Way and Air Conditioning Departments of railroads.

Section 26. In accordance with established practice, we claim for our members the right to apply and install any and all types of slate, tile, asbestos shingle, and asphalt shingle roofing; any and all types of prepared paper and felt roofing; any and all types of sheet, roll, plastic, asphalt, tar, slag, gravel or other composition roofing, specified as insulation or waterproofing in localities where there is no established local union of the United Slate, Tile and Composition Roofers Damp and Waterproof Workers Association.

Section 27. Each and every chartered and affiliated local union and council of this International Association and all officers, business agents, representatives and members thereof are obligated to recognize, protect and be governed by the jurisdictional rights of our members as set forth herein, and no affiliated local union, council, officer, business agent, representative or member thereof shall waive or relinquish claim to any of the work specified in this jurisdictional claim or submit same to arbitration except with the approval and written consent of this International Association.

PEXTO



No. 0617 BEADING MACHINE
CAPACITY — 18 gauge soft steel

. . . a TRADITION *for* 160 YEARS . . .

No. 0601 CRIMPER and BEADER
CAPACITY — 18 gauge soft steel

. . . because right from the start . . . in 1785 . . . PEXTO Machines and Tools pioneered the correct equipment for Sheet Metal Fabrication.

And all through the years of this industry's development PEXTO has provided the means for faster, more accurate production . . . better work.

THE PECK, STOW & WILCOX COMPANY *Since 1785* SOUTHINGTON, CONNECTICUT, U. S. A.

HERE'S THE STORY . . .

Quick

A THIN LAYER OF WATER

The reason for Thermo-Drip's efficient operation is simply illustrated above. Thermo-Drip maintains scarcely more than a sheath of water over the pan evaporating surface. Thermo-Drip's drip feed maintains a thin layer of water which vaporizes faster than a full pan of water. This exclusive Thermo-Drip feature, coupled with the light gauge, stainless steel vapor pan, makes Thermo-Drip the most efficient, low cost humidifier you can obtain.

A THIN BARE METAL PAN

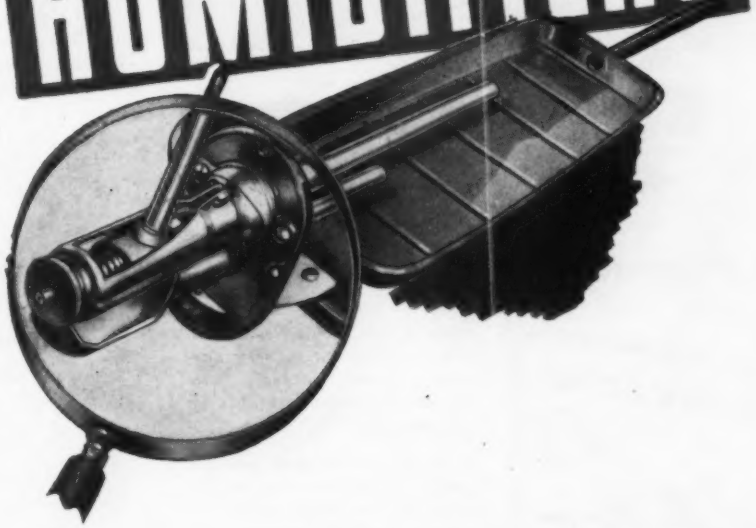
Because Thermo-Drip's stainless steel vapor pan is of extremely light gauge, humidification takes place quickly and maintains moisture in the air. Heating engineers say Thermo-Drip Humidifiers are the most practical air moisteners for all types of warm air heating systems.

THERMO-DRIP *Humidifiers Perform Because*

Installation is simple and sure; the entire device is of quality materials; there is no float, no mechanical parts, no instruments, no wiring. The Thermo-Drip feed valve stays cool, never limes up, never gets sticky. Positively prevents flooded pans and damage to furnace parts that are so frequently the case where hot feed valves are used.

Healthful comfort with . .

THERMO-DRIP HEAT REGULATED HUMIDIFIERS



WITH Thermo-Drip Humidifiers you can meet the challenge of warm air heating system users who say, "Provide properly balanced indoor humidity and temperature for our homes." Thermo-Drip Humidifiers moisten the air as it is heated *in direct proportion to temperature,* therefore the Thermo-Drip equipped warm air heating system insures ***healthful comfort*** at all times.

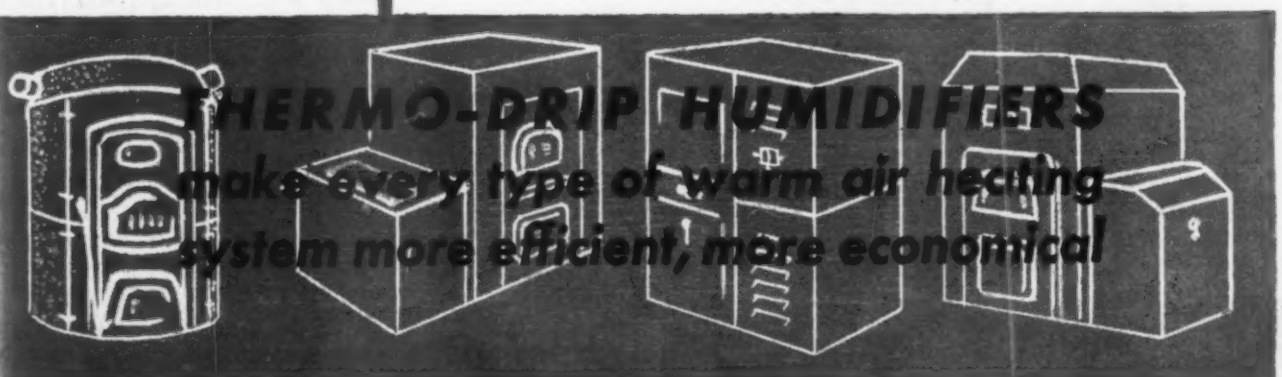
Every good humidifier must perform two services . . . it must regulate water feed *and* control the amount of evaporation. Thermo-Drip Humidifiers perform both of these services efficiently. With Thermo-Drip, *temperature,* not level deficiency, governs the amount of water admitted to the vapor pan. No more, no less than the amount of water called for *by temperature* will evaporate, and evaporation is almost instantaneous.

Thermo-Drip's heat regulated water feed feature gives any warm air heating system controlled evaporation . . . simplified, scientific moisture control for all warm air heated homes.

The simplicity of Thermo-Drip design, the efficiency of its construction and the complete elimination of guess work or chance in its operation, plus its low cost and absence of service, make it the ideal humidifier for every job.

Make greater profits, insure complete customer satisfaction with Thermo-Drip Humidifiers. Write for complete details today!

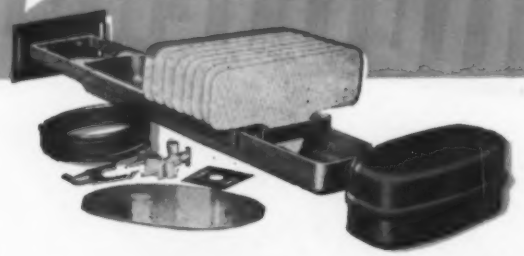
Automatic HUMIDIFIER CO.
CEDAR FALLS, IOWA



Check these advantages in the New Viking Humidifier

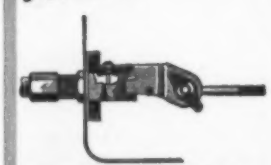
VIKING "TOP SEAT" FLOAT VALVE

COPPER FLOAT TANK

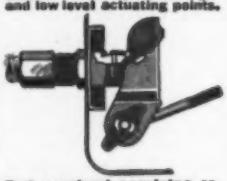


For Dependable Humidification

Positive Action



Throttle type action maintains the proper water level at all times . . . no complicated high and low level actuating points.



For occasional servicing or cleaning the brass wing nut can be loosened and the whole assembly exposed.

Disengage the brass cotter key and the complete float assembly can be removed for inspection or cleaning.

Here is the humidifier you've been waiting for. Simple and easy to install and designed to operate for years with little or no attention.

Exhaustive study and research under actual operating conditions has dictated the need for a simple, easy to clean valve and an acid resisting water supply tank. Viking has the solution.

THE VALVE

Made entirely of brass and located above the water level in the supply tank. Simple rocker action . . . no springs no sliding parts.

THE TANK

Deep drawn from 24 oz. copper in a single piece . . . no seams . . . no welds. Located outside the bonnet or plenum . . . readily accessible for occasional inspection or cleaning.

WRITE TODAY

. . . get complete information and specifications on a dependable humidifier.

Viking

FOR EXCELLENCE

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

Heat Losses From Floors Laid on Ground

(*Continued from page 134*)

at the site were used in determining the degree-days Second, that the commonly accepted degree-day system is based on an outside temperature of 65° F, whereas F_2 is based on an inside temperature of 70° F for the structure.

For estimating design heat losses from slab floors on the ground, factors are suggested for use in three formulas, as follows:

(1) $Q = LF_1DD$

(2) $Q = LF_2(T_{is} - T_{os})$

(3) $Q = LF_3(T_{is} - T_g)$,

in which

Q = heat loss from floor, Btu per hour;

L = length of edge of floor adjacent to exposed wall of building, feet;

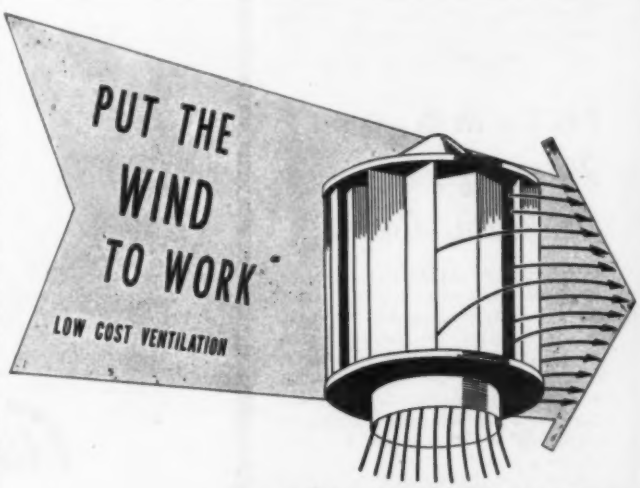
DD = number of degree-days occurring in month preceding instant for which estimate is made;

T_{is} = temperature maintained within building, degrees Fahrenheit;

T_{os} = average outside temperature during a week preceding instant for which estimate is made;

F_1 = heat loss factor, Btu per hour for each foot of exposed edge and for each degree-day occurring during the month preceding the instant for which the estimate is made;

F_2 = heat loss factor, Btu per hour for each foot of exposed edge and for each degree Fahrenheit average difference in air temperature inside and outside the building during a week



with AGITAIR EXHAUSTERS

With no power or maintenance costs, the Agitair wind-actuated exhauster sucks hot air and fumes out of a building when only a gentle breeze is blowing—no matter which way the wind.

It's simple to mount atop any roof, vent or stack. No back-drafting. Weatherproof. When no breeze, Agitair's wide orifices permit maximum natural ventilation. Ask for Bulletin EX-101.

Applications:

Industrial Ventilation
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—and many others

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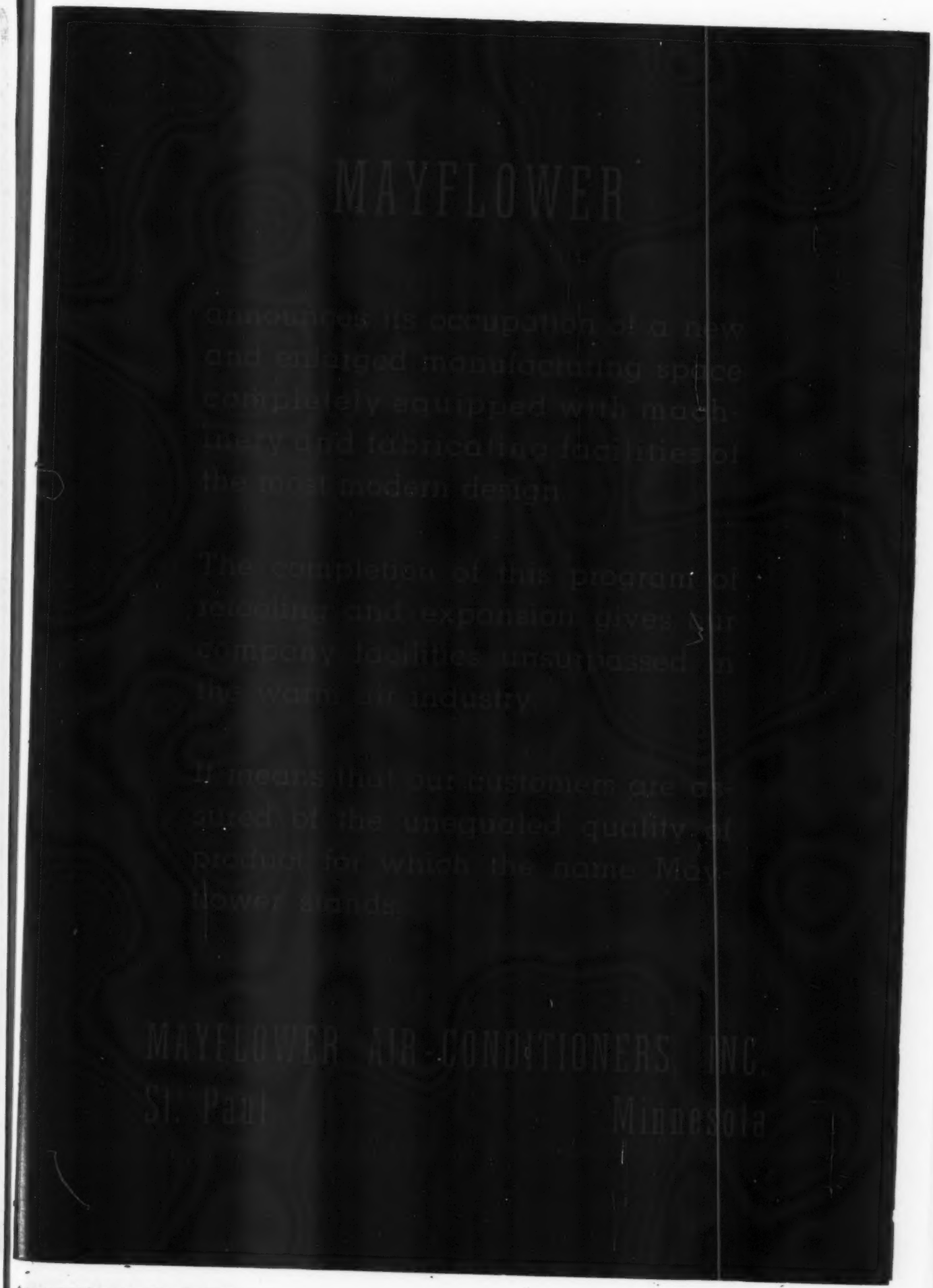
21-E


MAYFLOWER

preceding the instant for which the estimate is made;

F_3 = heat loss factor, Btu per hour for each foot of exposed edge and for each degree Fahrenheit difference in temperature between the air above the floor and the ground 1 ft. below the surface, at a distance of 35 ft. from the structure, at the instant for which the estimate is made.

Of the three factors, F_1, F_2 and F_3, it is believed that F_3 would yield the best estimate of floor heat loss. However, since ground-temperature data for many localities are not available, the use of F_3 may, in some instances, be impracticable.

For general purposes, factor F_2 is probably the most adaptable because of the possibility of estimating with reasonable accuracy the average temperature during the coldest week occurring in a locality. This factor will probably yield more accurate results than F_1 because so many houses are maintained at other temperatures than 65° F., on which F_1 is based.

The data are probably sufficiently accurate basis for many estimating purposes because the floor heat loss is likely to be small compared to other losses. However, the data are incomplete in that they do not cover the cases of frozen ground and of snow-blanketed ground. To supply data, it would be necessary to repeat the tests in a colder climate.

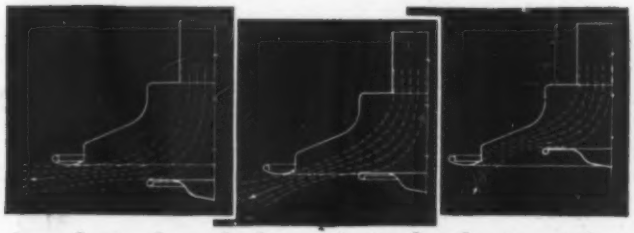
No reason is apparent why the data are not applicable for regions where the average outdoor temperature does not remain continuously below freezing for more than a day or so, except that snow, which is an insulator, may decrease the floor heat loss.

The data indicate that insulating the floor at the edge is beneficial both in saving heat and in reducing lateral temperature gradients across the floor.

How *adjustable* air diffusers increase the efficiency of supply air diffusion.

Better mixing of room and supply air, more uniform temperatures throughout the occupied zone and noiseless, draftless air diffusion are accomplished with

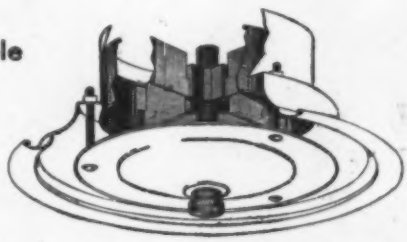
KNO-DRAFT *adjustable* Diffusers



Any desired angle from vertical to horizontal at your fingertip.

By simply turning the air adjustment screws (easily accessible from under the unit) the inner cone of any KNO-DRAFT Diffuser may be raised or lowered to secure any angle of air direction required by ceiling heights, system balancing, and individual or seasonal requirements. Thus the diffuser becomes more effective whether it is used in cooling, heating, ventilating, or combined systems, because it can expel chilled air parallel to the ceiling or eject heated air downward to prevent stratification.

Type K Adjustable Diffuser with Type D Volume Damper.



Pat. and pat. pending

Any desired volume at your fingertip

Every KNO-DRAFT Diffuser can be equipped with a built-in volume damper (easily adjusted by hand-turning knob under diffuser) which varies the outlet aperture uniformly without affecting the outlet velocity or diffusion pattern.

Thus KNO-DRAFT Diffusers can be adjusted quickly and accurately to the angle and volume needed to meet a wide variety of conditions, and as a result, the factors of temperature variation, temperature fluctuation, drafts and noise can be minimized considerably.

The W. B. Connor Engineering Corp. maintains a staff of specialists and district representatives in leading cities to assist you with any air distribution problem.

FREE HANDBOOK

Contains clear sketches, charts, dimension prints and instructive text that simplify the selection and installation of air diffusers.

For your copy write Dept. J-11.

W. B. CONNOR ENGINEERING CORP.

Air Diffusion *Air Purification* *Air Recovery*

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FURNACE PIPE and FITTINGS

DUCTS

•

SMOKE PIPE

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FURNACE PIPE

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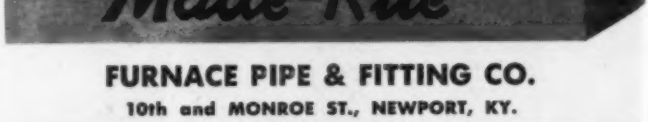
FITTINGS

See for yourself how MADE-RITE's "one-stop" source of supply helps you to more money and better installations. Precision manufacturing of Furnace Pipe, Duct Work, Smoke Pipe, and Fittings is the big reason for our established reputation.. We'll help you select the right pipe or fitting for the job . . . and can, in most cases, supply ALL your needs with parts that will FIT the first time.

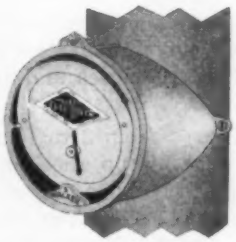
The address is below and all you have to do for more information on the precision manufactured "one-stop" source of supply for fittings, etc., is just drop us a postcard. Please do it now.



FURNACE PIPE & FITTING CO.

10th and MONROE ST., NEWPORT, KY.

Think This Over!



WALKER FUEL SAVER TYPE NO. 34

maintains proper draft regulations under all conditions for furnace, boiler, stove or hot water heater. Domestic sizes 4" to 20" inclusive, furnished with or without collar, in either Galvanized metal or Cadmium Plated finish, if and when available.

COMMERCIAL AND INDUSTRIAL FUEL SAVER DRAFT REGULATOR

Walker makes a full line of industrial controls. Sizes 16" to 36" inclusive, made of heavy cast ring with deep-drawn flanged steel plate with adjustable ball-bearing construction. For use with the heaviest drafts and any kind of fuel.

WALKER FUEL SAVER TYPE 34-B AND 34-C WITH STOVE PIPE TEE JOINT

More than 4,500,000 units of these famous WALKER Regulators have been installed for the fuel users of America. Furnished in sizes 3" to 10" inclusive, in blue, chrome or cadmium, if and when available, and packed in individual cartons or bulk.

Millions of Tons of the nation's vital fuel supply can be saved throughout the 1946 heating season by the installation of proper Automatic Draft Controls.

Never in the history of the Heating Industry has there been a more critical condition in the fuel supply of America.

As a Stove or Furnace Manufacturer, Distributor or Dealer this is your opportunity to serve your nation, and at the same time build for yourself a secure Postwar business.

Why not start today making a survey of the heating units in your territory? Walker Automatic Draft Regulators should become a permanent part of every heating unit. They are easy to install, but best of all—a money-making addition to your line.

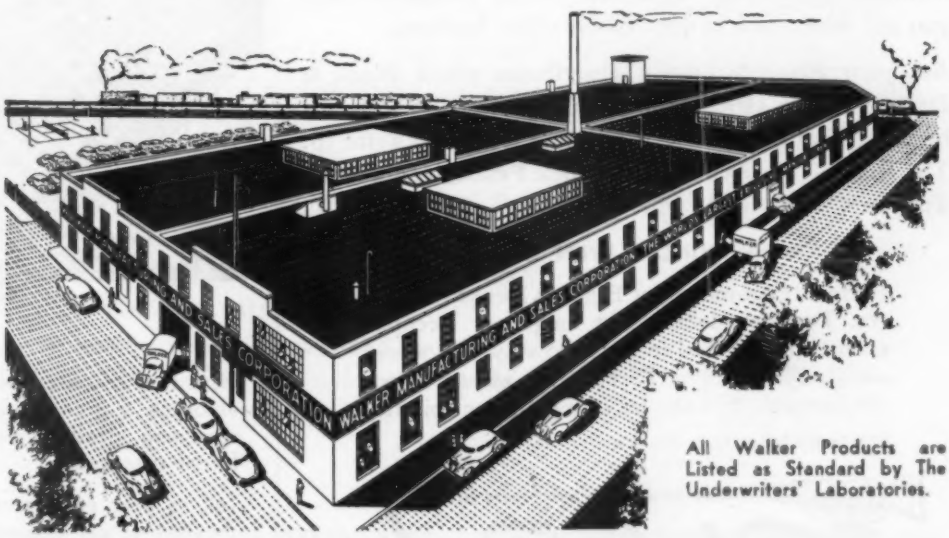
FUEL — SAVING STARTS WITH DRAFT CONTROL

Millions of WALKER AUTOMATIC DRAFT CONTROLS are at work Day and Night in Manufacturing Plants, in Army Camps, in Public Buildings and in the Nation's Homes conserving fuel. Could there be better proof of Walker's unrivaled quality in Automatic Draft Controls?

Walker manufactures an AUTOMATIC DRAFT REGULATOR for any type of heating system, from the smallest domestic to the largest industrial unit using any kind of fuel.

REMEMBER!

Walker is an exclusive manufacturer of Automatic Draft Regulators. He does not compete either directly or indirectly with any manufacturer of any kind of heating unit.



All Walker Products are Listed as Standard by The Underwriters' Laboratories.

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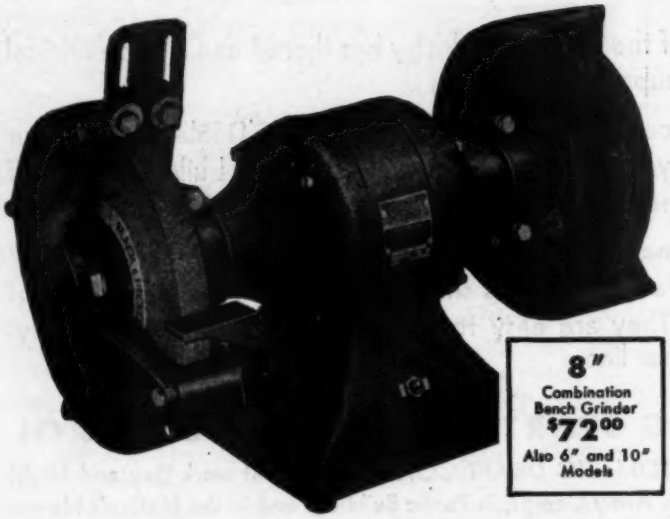
Sharper TOOLS! Smoother JOBS!

. . . with Black & Decker BENCH GRINDERS



Black & Decker Bench Grinders keep a keen cutting edge on your tools—help you turn out cleaner work, faster. These Grinders handle many other jobs too! They grind pipe, rings, connections, fixtures, etc.—wire brush, buff, burnish, polish and finish sheet metal—remove weld marks and saw or shear burrs.

Long wheel spindles and tapered end housings make room for large or odd-shaped pieces. Powerful motors maintain high operating speeds under pressure—help you get work done sooner. Many other features.

Ask your Black & Decker Distributor about Black & Decker Bench Grinders and other Electric Tools for heating, piping and air-conditioning work. Or write to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

"WHIRLWIND"* WIRE BRUSHES

Perfect team-mates for Black & Decker Grinders. Tougher, denser, last longer . . . because each tuft is locked in place to stay. Six wheel sizes: 4" to 12". Three wire sizes. Three thicknesses. Fit almost any arbor or spindle.

*Trade-Mark Reg. U. S. Pat. Off.

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PORTABLE ELECTRIC TOOLS

DRILLS • HOLE SAWS • DRILL STANDS • PORTO-SHEARS
BENCH GRINDERS • SANDERS • PORTABLE GRINDERS

Round Elbows of Welded Construction

(*Continued from page 172*)

Using Chart No. 5

This chart is designed for instantly determining the degree of angle for the mitre cut line of the first piece in elbows having from 2 to 10 pieces and from 10 to 90 degree angle.

The top horizontal line of figures from 2 to 10 represent the number of pieces making up the elbows. The first and fourth vertical lines of figures represent the angle of elbows from 10 to 90 degrees. The second vertical column gives the angle for the line for 2-piece elbows from 10 to 50 degrees. The third vertical column gives the angle for the mitre line for 3-piece elbows from 40 to 50 degrees. It is doubtful if elbows with 3 pieces below 40 degrees would ever be called for, so this space is left blank. The fifth vertical column gives the angle for the line for 2-piece elbows from 50 to 90 degrees. The sixth vertical column gives the angle for the mitre line for 3-piece elbows from 50 to 90 degrees. With this explanation the remaining columns are readily understood. The blank space represents angles that will probably never be used.

Example

Example: Assume the elbow outlined in Fig. 4 will

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Tell us your requirements and we will send booklet showing actual sizes of perforation.

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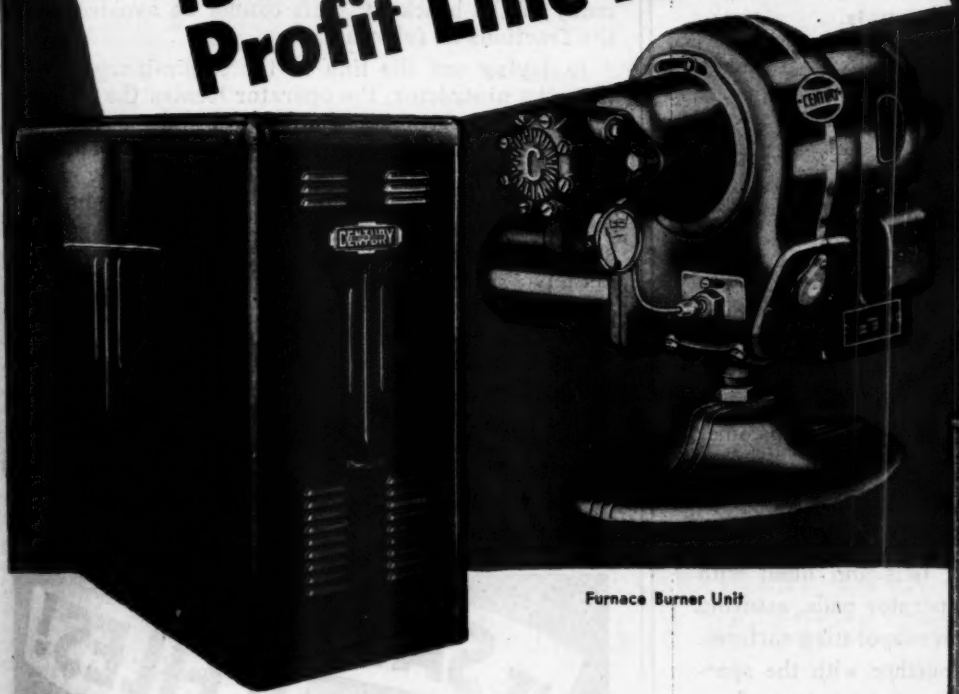
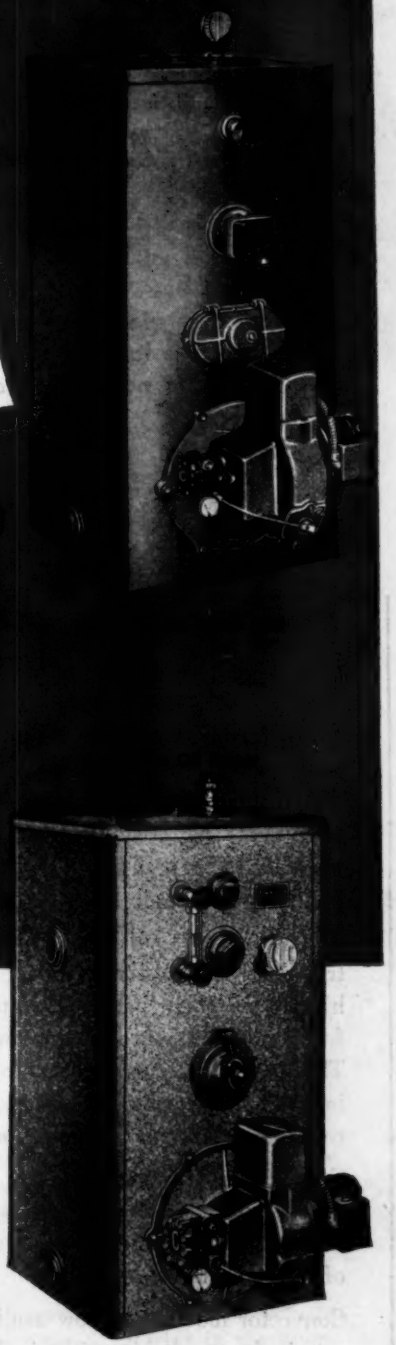
Century is Rolling with the Profit Line for '46



Furnace Burner Unit



Boiler Burner Unit

THE Century Line of oil-fired heating equipment is now fast becoming available. Manufacturing skill, years of research and scientific advancement all contribute toward making Century's new and improved equipment a leader in the field. Alert, profit-minded dealers will find the new line of Century units quality merchandise that assures satisfied customers. There is quality at low cost in the units shown, which are now available in limited quantities. New efficiency and economy of operation cuts heating costs. As more materials become available our production output will be increased in quantity, and in the number of models manufactured. You will profit by joining the thousands of dealers now selling Century oil-fired heating units.

Several distributorships in excellent territories are now available for progressive dealers interested in profitable selling with the Century Line.

CENTURY ENGINEERING

CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES

HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

FOR VITALIZED HEAT

Convector HUMIDIFIER

In sizes to meet requirements of largest to smallest warm air furnaces. Now available for straight bonnets

When furnace check-ups reveal a need for humidifier replacement, or when new furnaces are indicated, install the Convector Automatic Humidifier. You not only make more money, you assure your customer more reliable and efficient humidification, even at low temperatures.

The Convector consists of one, two or four copper troughs built into a compact unit and fitted with highly absorbent patented evaporator pads, assuring free flow of moisture to exposed evaporating surfaces. This exclusive construction, together with the spacing of the troughs to permit unrestricted air flow, results in maximum evaporation.

Corrosion resisting materials. A non-back-siphoning automatic water feed valve, approved by National Plumbing Laboratory, guards against contamination of domestic water supply.

Convector models are now available for straight bonnets in fourteen sizes with single or multiple troughs from 15 to 34 inches. The units are easily installed and easily removed for servicing.

FURNACE MANUFACTURERS

On your new designs, hold up final specifications until you get the facts about our new, improved automatic humidifier. Send us your name so that full information can be sent to you as soon as specifications and materials are ready.

MAID-O-MIST INC.

3213 North Pulaski Road
Chicago 41, Illinois

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

be used in a boiler breeching and constructed from 14 gauge steel. As this is low velocity work, a 3-piece elbow will be satisfactory. To find the angle for the miter line on Chart 5 locate the 75-degree angle; this is found in the fourth column. Now move in the same line to the right under the column headed by the figure 3 (for 3-piece elbows); the bracket in this column shows 18¾, or 18¾ degrees angle for the miter line of the first piece in this elbow.

Note on Fractions

A word here in regard to fractions shown in many brackets of the chart before proceeding with the preliminary drawing.

Degrees and fractions of a degree are shown in many of the brackets. This cannot be avoided, so use the fractions as follows:

In laying out the line in the preliminary drawing with the protractor, the operator locates the 18-degree mark, then estimates as carefully as possible the ¾-degree point; draw a short line on the paper with a fine pointed pencil. A slight error of a few minutes of a degree on the protractor will make little difference in the finished elbow, as corrections are made with the stay and checking before the pieces are tacked together.

In some brackets such fractions as 13/18 will be seen. One must remember that 9/18 is ½ degree, so 13/18 is practically ¾ degree. A few trials will give the operator confidence in handling these fractions. Always use care in starting the miter line, then recheck again after it is drawn. A good protractor is essential, the larger the better. Those made from clear plastic are preferable to the metal ones.

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A PORTABLE POWER-SAW AND FILE

New MULTI-PURPOSE TOOL

SAVES TIME — SAVES MONEY

★ The Saw-Chief attaches to electric and air drills, or may be driven by flexible shaft. Hack-saw blade in holder reciprocates rapidly with a 7/8" stroke. Cuts all metals—every gauge, wood, plastics, other materials. Eliminates slow, tiresome hand-sawing operations. Reaches into hard-to-get-at places with ease. Insert ordinary machine file for power-filing operations. It's portable . . . carry it from job to job.

QUICK DELIVERIES

The Saw-Chief can be shipped quickly, ready for attaching to your drill or flexible shaft at only $45.00. May also be obtained complete with heavy duty drill at $90.00, or with high-powered, lightweight drill at $83.00.

LIBERALLY GUARANTEED

SAW-CHIEFS are guaranteed to give complete satisfaction. Your money refunded if the SAW-CHIEF does not save hours of labor on countless operations.

Phone your jobber for demonstration today or write us direct!

ORDER SAW-CHIEF TODAY

CHICAGO PRECISION EQUIPMENT CO.

920 SO. MICHIGAN AVE., CHICAGO 5, ILLINOIS

MID-JANUARY HEADLINES:

when it comes to giving you authentic and *fresh* information on what conditions will be like for all of us in 1946.

This is being written in mid-December. We can only *guess* at what America's industrial situation will be like by the time you read this . . . and that national situation (as described in your daily paper's headlines) will determine what 1946 holds for your business—and ours.

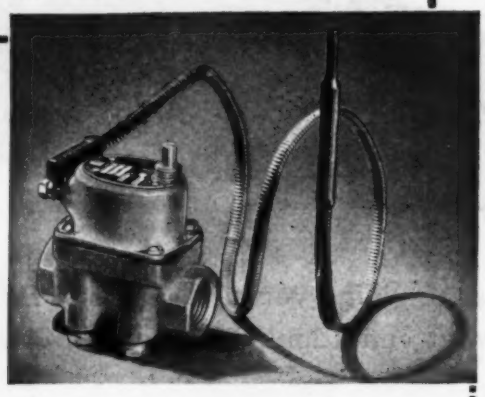
ALL YOU'LL HAVE TO DO WILL BE TO ADD TO THOSE HEADLINES, YOUR OWN INTELLIGENT KNOWLEDGE OF THESE FACTS: . . . . . .

1. HANDY PIPE can be made only as fast as sheets can be procured from mills and as fast as workmen properly fabricate the sheets.
2. Our buying facilities and our sources are second to none in the industry.
3. HANDY PIPE is still the standard of quality and perfection of design that made it the industry's "yard stick".
4. We are anxious and eager to make and ship as many carloads as our customers desire . . . and just as quickly as the national industrial situation makes it possible, we will be doing just that!
5. Meanwhile, we (like most firms in most industries in the country) are filling every possible order at the utmost possible speed.

There—*without kidding*—is the true story as of the date you read this, including whatever has happened by then. It is our sincere hope that America will go to work and produce as much of the billions of business volume (which means JOBS) as is possible in 1946. THEN IT WILL BE A GREAT YEAR!

F. MEYER & BRO. CO.
PEORIA, ILLINOIS

New MR-2 SAFETY THERMOVALVE



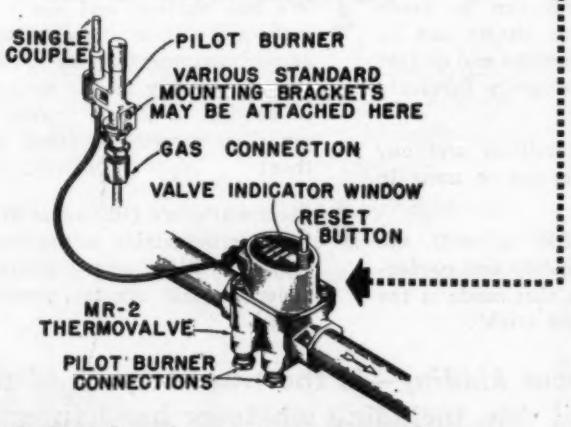
THIS new electro magnetic thermovalve assures unfailing safety in gas control applications. Used on space and unit heaters, central and floor furnaces, water and range heaters, hot water and steam boilers. Handles manufactured, natural or LP-Gases.

Check these outstanding features:

- Streamlined design.
- High-flow capacities.
- Visual valve position indicator.
- Design simplicity.
- Sealed electro magnetic assembly.
- Heavy duty 5/16 round thermocouple.
- Flexible armored cable leads.

On the diagram below, the new MR-2 valve and the new 26-R Pilot Burner are used for out-pilot safety control. No outside current is required. Valve holds open until released by pilot-flame failure. 100% gas shut-off will be maintained until pilot light is reignited and valve manually reset by push button.

MR-2 INSTALLATION



For further information, contact your nearest factory branch or distributor, or write for Catalog 52-B and Manual FI-101.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

15-2

How Much? In Blower Sales

(*Continued from page 131*)

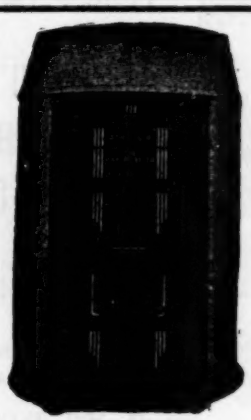
ing the old warm air register and would install an additional 7-inch run to a new floor register, the position of which is likewise shown by dotted lines in Fig. 2.

His preference would be to run a return down from the Second Floor hall through the First Floor closet which opens off the dining-room, but he would not require this if the owner objects to the added cost. Therefore, this return from the Second floor is not shown in Fig. 2 because Fig. 2 represents his "minimum requirements" for this particular conversion job.

A "Take-a-Chance" Estimate

The conversion installation as it would be made by a dealer in Group 3 to whom the original gravity layout (Fig. 1) was submitted, is shown in Fig. 3. This dealer would not replace any of the warm air ducts, but would vacuum clean all of them. He would not install an additional warm air register in the living-room; would leave the return air face in that room in its original position; would not install a return air from the kitchen. He would extend the original 16" gravity return duct from the dining-room, around to the other side of the furnace and tap it into the side of the return air plenum. He would not install lock dampers in the warm air runs if the old dampers were reasonably tight. He never places dampers in return air ducts.

He agrees that the use of the circular baffle plate



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For more than 50 years the name Ath-A-Nor has meant top quality and best performance in furnaces. Economy and efficiency are the best-known qualities of the Ath-A-Nor furnace and of Ath-A-Nor furnace repair parts. Buy and install Ath-A-Nor for best results and greatest fuel economy!

MAY-FIEBEGER COMPANY
MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS
NEWARK, OHIO

IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING

$2.00

SEND TODAY FOR

Samuel R. Lewis'

"AIR CONDITIONING FOR COMFORT"

288 Pages—6¼" x 9¼"—Illustrated—
Cloth Bound—$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Several complete examples of correct design procedure are given, together with forms for recording the design data, the proper filling-in of which are explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and chart in order to render both devices thoroughly understandable.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume one of the most readable and complete books on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Use the coupon at the left to order your copy now.

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CHAP. 5—The Psychrometric Table and Chart
CHAP. 6—Humidity Controllers and Control
CHAP. 7—Heat Transmission Through Barriers
CHAP. 8—Ventilation, Solar and Appliance Heat
CHAP. 9—Heating Systems
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10" x 16" Psychrometric Chart..Inside Back Cover

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LET "MR. TOPS" CONTROL YOUR TIMING of

AUTOMATIC
HEATING
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OPERATIONS

"Mr. Tops," The Paragon Symbol of Top Quality.

Paragon 700 Series Time Switches are equipped with 6" calendar dials which make one complete revolution every 7 days. Dial trippers can be independently set for different daily ON and OFF schedules. Settings can be made in advance for an entire week. Any day or days operations may be omitted entirely on a pre-set program.

Write for a complete bulletin.

The Paragon 700 Series Time Switch

PARAGON ELECTRIC COMPANY
719 Old Colony Bldg.
Chicago 5, Illinois

Paragon Chicago
MAKERS OF ELECTRICAL EQUIPMENT

at the line of the top casing ring is often desirable and sometimes necessary. But he says he prefers to "take a chance" on an occasional trouble job rather than to make it a practice to install such a baffle in every gravity furnace casing to which he attaches a blower.

Instead of having standard selling prices for the various items of equipment and labor, he estimates his total cost and then doubles it to get his selling price. These items are as follows:

Blower	$59.00
Return Air Plenum	4.60
8 feet of 16" Pipe	4.00
1—16" elbow	1.57
1—16" draw band	.67
Miscellaneous	5.00
Total material	$74.84

His labor items are estimated as follows:

Installing blower	$10.00
Vacuum cleaning 7 warm air runs and 2 return air runs at $1.00 each	9.00
Extending the dining-room return air run around the furnace and connecting to the blower	3.00
Miscellaneous labor	5.00
Total labor cost	$27.00

Thus, his total estimated cost is $74.84 for material plus $27.00 for labor which makes $101.84 and his selling price is double this, which is $203.68.

For comparison, the following tabulation gives the respective selling prices, costs and margins in dollars

SELL Humidified Air with the Skuttle AUTOMATIC HUMIDIFIERS

SERIES 300

Furnace manufacturers and dealers who recognize the importance of moisture in the home, find the Skuttle Model 300 Series Automatic Humidifiers ideal for any type or size of home. It features the adjustable rear support, adjustable collar, large inspection door and a size range from 18" to 30".

For full information and prices write today!

517 E. LARNED

Skuttle Mfg. Co.

DETROIT 26, MICH.

Capacity Loss Is a Thing of the Past

Up to now, the shutter has barred the complete removal of warm air and noxious gases from factories and workrooms. Shutters of ordinary design simply cannot accommodate the full exhaust capacity of ventilating fans, nor can ordinary shutters close tightly enough to keep out cold air. The revolutionary design of the new Air-Flo shutter attains an unprecedented performance peak—for the first time, a shutter does what it is supposed to do—opens to 90° to *let* air out, closes firmly to *keep* air out. Now starting in quantity production, AIR-FLO shutters will be available for your new construction or remodeling. Write today for illustrated descriptive folder.

A TEAM WORKING FOR YOU FOR ALL YEAR PROFITS

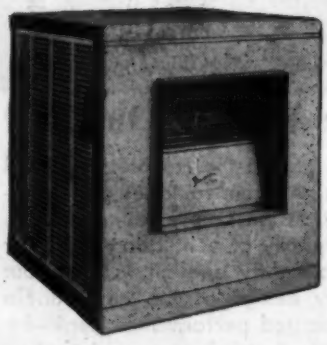
IN WINTER

Palmaire GAS FURNACES

Just one of a complete line of high quality gas furnaces, all with built-in features that pack a fast-selling wallop and assure satisfaction. Illustrated is forced air furnace.

IN SUMMER

SNO-BREZE EVAPORATIVE COOLERS



Full line of all sizes, types evaporative coolers, backed by 30 years' manufacturing experience. Illustrated is horizontal blast blower type cooler.

Palmer MFG. CORP.
Phoenix, Arizona

and in percents of the conversion jobs shown in Figs. 2 and 3, respectively:

	Fig. 2 Installation	Fig. 3 Installation
Selling Price	$338.00	$203.68
Cost	237.62	128.84
Margin, dollars	100.38	74.84
Margin, % of S. P.	29.6%	36.8%

Although the profit in dollars is greater for the installation shown in Fig. 2 than for that shown in Fig. 3, the margins expressed in per cent of selling price are approximately 37 per cent for the "poorer" installation and 30 per cent for the "better" installation.

◆

The Family Partnership

(*Continued from page 120*)

time where there was no thought of dissolving the corporation.

Recognition of a resultant partnership is uncertain if a gift of stock is made to the wife as part of a plan to dissolve the corporation and operate as a partnership. Final decision in such a case will probably depend on the determination of the general family partnership question.

Properaire ● AIR MOVING EQUIPMENT—

BLOWERS
EXHAUSTERS
FANS

for Homes
Stores
Offices
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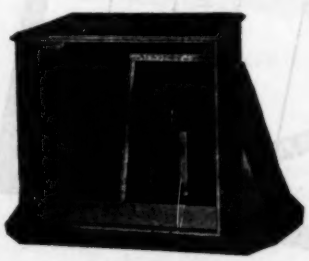
"B" ASSEMBLY Belt Drive



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TYPE E Direct Drive

Ask your Jobber to write for "Blower File" FREE

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A·R·A SHEETS

Every day sees more and more of the alert Sheet Metal Contractors putting in jobs with A-R-A Sheets where the work heretofore was done with sheet metal. You, too, will find it easy and inexpensive to use A-R-A Sheets.

With the sheet metal situation becoming more critical and with the metal stock piles in dealers' shops getting smaller every day, it should be comforting and profitable to have available these popular A-R-A sheets for immediate use.

You can only be sure of the Inventory you actually have on hand when scheduling your jobs. You *can't* fabricate duct work or seal in joists with *rumors, promises, or hopes.* Now is the time to take advantage of the availability of A-R-A Sheets—tested, approved and pronounced the most satisfactory and safest sheet of its kind on the market today!

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20 Sheets 33"x48" per Carton

SHIPPING WEIGHT
Approximately 100 lbs. Per Carton

Write for our 16-page booklet No. 89-A. Gladly sent on request.

Asbestos-clad A-R-A Sheets are tough yet flexible (Mullen-tested over 200 lbs. per sq. in.)—rigid but not brittle—fire-proofed and water-proofed—are light in weight, will not dry out, crack, crumble, or chip, have a high insulating value (K .45 B.T.U.) and good sound-deadening properties. They are easy to handle, will bend without breaking and can be rolled, punched, scored and die cut, still retaining their rigidity and strength.

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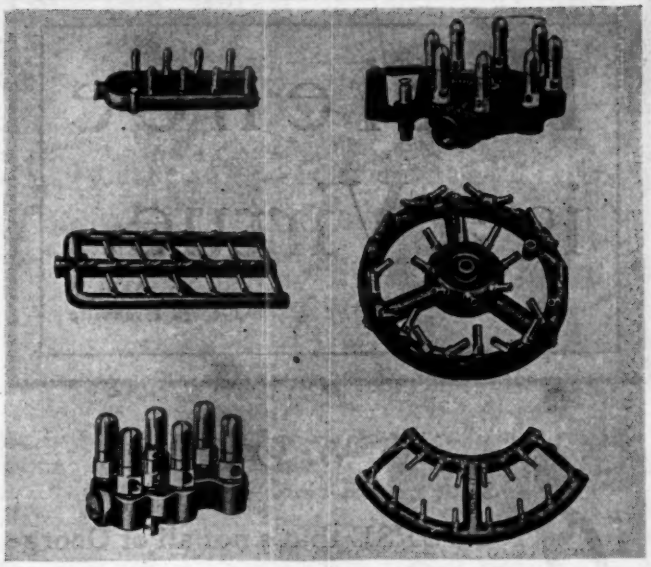

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Stands for the Finest in Gas Burners

With reconversion for civilian production fully accomplished, Barber offers, for 1946, finer products than ever before. Gas burners come and go, but the tried and tested Barber design is still recognized for its superiority over many competitive, EXPERIMENTAL burners, because of its basically better combustion principle. Now, with added improvements and refinements, a Barber unit remains the outstanding symbol of MERIT in gas-burning equipment.

If you make or sell a gas appliance, remember that the heart of the appliance—the thing by which your product stands or falls—is the burner. If you use conversion burners, remember that Barber units, for all round or square furnaces and boilers, are tailor-made so that they accurately fit the job and give maximum efficiency, both from the heating equipment and the fuel.

Barber engineers are at your service to plan with you now on your specific requirements for appliance burners, conversion burners, and pressure regulators.

We are gas burner specialists, and offer you our engineering and plant facilities for the development and manufacture of burner units for your specific purposes. Write for Catalog illustrating and listing many types of Burners for Appliances, Gas Conversion Burners for Furnaces and Boilers, Regulators, etc.

THE BARBER GAS BURNER CO.
3704 Superior Ave., Cleveland 14, Ohio

BARBER *Automatic* JET GAS BURNERS

Patience is a Virtue..

George Granville

OF COURSE that's not all of George Granville's famous quotation, but it's enough to illustrate our story.

We thought it appropriate to remind you of the need for patience because it will be some time yet before you are able to go after your home-heating prospects in the good old-fashioned way. Our present circumstances, along with other manufacturers, preclude any possibility of supplying you the way we would like . . . and we WON'T be able to for awhile yet.

We would like you to remember, however, that we've been making quality furnaces and air conditioning plants for over forty years and when we ARE able to make deliveries you may rest assured the units will incorporate all the experience and "know-how" we've accumulated in that time. It will be a while longer, but more to your advantage in the long run.

WISE PEOPLE BUY WISE FURNACES LESS FUEL - MORE HEAT

WISE FURNACE CO.

AKRON 8, OHIO

Giesecke—Panel Warm Air System

(*Continued from page 127*)

The mean surface temperature is 53,950 ÷ 838 or 64.4 F.

Step 3—The ceiling must deliver heat to the room at the rate of 13,000 Btuh. or at the rate of 13,000 ÷ 234 or 55.6 Btuh. per sq. ft. In which 13,000 equals total heat loss of room; 234 equals area of ceiling.

When the ceiling is the heating panel of a room, it delivers about 70 per cent of the heat by radiation and about 30 per cent are conveyed from the heated ceiling by air currents. Hence, in this case, the ceiling must radiate more heat to the floor and walls than those surfaces radiate at the rate of 0.70 × 55.6 or 38.9 Btuh. per sq. ft. of the ceiling.

All surfaces found in nature radiate energy at all times; the rate of radiation is proportional to the fourth power of the absolute temperature of the surface. The types of surfaces generally found in buildings radiate energy at the rate of $0.156\left(\frac{T}{100}\right)^4$ Btuh. per sq. ft. where T is the absolute temperature of the surface on the Fahrenheit scale.

Since the mean surface temperature of the floor and walls is 61.5 F., those surfaces radiate heat at the rate of 0.156×5.215^4 or 115 Btuh. per sq. ft.; the

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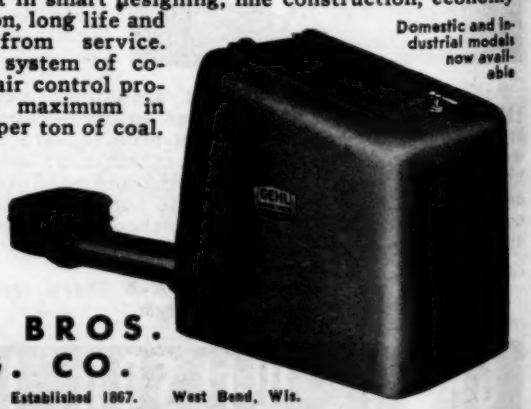
Gehl Stokers in most every State in the Union give many years' evidence of outstanding performance. It will pay you to tie up with this established public acceptance. Engineered by experienced stoker specialists—a 79-year-old Company, Gehl Stokers have extra values that are evident in smart designing, fine construction, economy of operation, long life and freedom from service. The Gehl system of co-ordinated air control produces the maximum in heat units per ton of coal.

Domestic and industrial models now available



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Dept. BA800. Established 1867. West Bend, Wis.

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Barth U.S.A

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Improved and Modern Machines and Tools for Sheet Metal Work

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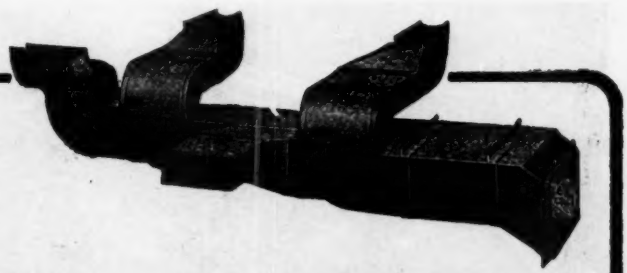
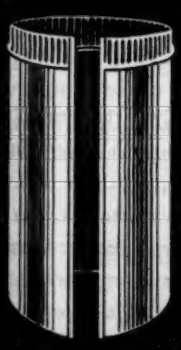
THE BARTH MANUFACTURING CO., MILLDALE, CONN., U.S.A.

CHAR-GALE



● Because they're already engineered to save you time and trouble, you can make extra profits with Char-Gale "Pre-fabricated" Ducts and Fittings. Made by standard mass production methods . . . all sizes are accurate . . . no delays on the job. Try us on your next installation.

Pre-Fabricated DUCTS *and* FITTINGS



SMOKE PIPE

◀ Backed by years of experience, the Char-Gale double offset lock gives continuous satisfaction.

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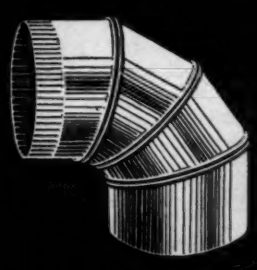
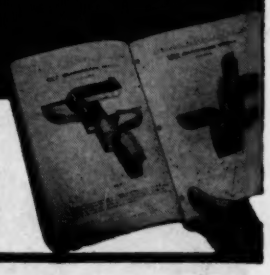
Easy to adjust . . . extra ▶ large segments . . . won't come apart. Char-Gale elbows are trustworthy.



PRE-FABRICATED AIR DUCTS

▲ The "quick-method" chart in the Char-Gale catalog gives accurate sizes for any job and figures costs for you. Send for it.



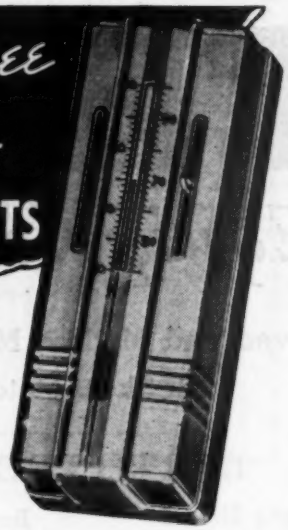
CHAR-GALE MANUFACTURING CO.

CATALOG NO. 40

For complete information on smoke and stove pipe, elbows, warm and cold air pipe, registers and air filters write CHAR-GALE Mfg. Co., 3125 Hiawatha Ave., Minneapolis 6, Minn.

for worry-free sales...

G-A THERMOSTATS



• Dealers like to handle Gleason-Avery Thermostats, because they're fast-selling, give the safe, accurately controlled heat that customers want.

Easy to install, too . . . *and* you don't have to worry about costly service calls. (G-A exclusive Straight Line Control eliminates troublesome sprockets and rotating arms; in case of current failure, draft damper closes automatically and check opens.)

Approved by Anthracite Industries Laboratory

No. 130 Furnace Sentry Unit Package for hand-fired systems, complete with thermostat, damper motor and accessories—ready to install.

LIST PRICE..$20.45

Direct orders accepted when accompanied by wholesaler's name.

Gleason-Avery, INC.
AUBURN, N. Y.
A RELIABLE NAME IN TEMPERATURE CONTROLS

ceiling must, therefore, radiate heat at the rate of 115 + 38.9 or 153.9 Btuh. per sq. ft. and the tem-

TABLE 2. TOTAL HEAT EMISSION BY RADIATION[a]

Body or Mean Radiant Temperature Deg F	Radiation in Btu per square foot per hour emitted to surroundings with a temperature of absolute zero by bodies at various temperatures and with emissivity factor ϵ				Body or Mean Radiant Temperature Deg F	Radiation in Btu per square foot per hour emitted to surroundings with a temperature of absolute zero by bodies at various temperatures and with emissivity factor ϵ			
	ϵ 1.00	ϵ 0.95	ϵ 0.90	ϵ 0.80		ϵ 1.00	ϵ 0.95	ϵ 0.90	ϵ 0.8
30	99.7	94.7	89.8	79.7	71	137.0	130.1	123.3	109
35	103.9	98.7	93.6	83.1	72	137.9	131.0	124.0	110
40	108.0	102.8	97.2	86.4	73	138.9	132.0	124.9	111
45	112.5	106.9	101.3	89.0	74	140.2	133.1	126.1	112
46	113.3	107.7	102.0	90.8	75	141.6	134.4	127.4	113
47	114.3	108.6	102.9	91.5	80	147.2	140.0	132.5	117
48	115.2	109.5	103.8	92.3	85	152.9	145.2	137.6	122
49	116.0	110.3	104.5	92.8	90	158.5	150.5	142.7	126
50	116.9	111.0	105.3	93.6	100	170.3	161.7	153.2	136
51	117.9	112.0	106.4	94.4	110	182.3	173.2	164.2	146
52	118.8	112.9	106.9	95.1	120	195.6	185.7	176.1	156
53	119.8	113.8	107.8	95.9	130	210.9	200.4	189.8	168
54	120.6	114.6	108.6	96.6	140	224.1	212.9	201.8	179
55	121.7	115.5	109.4	97.3	150	238.0	226.1	214.4	190
56	122.6	116.4	110.3	98.1	160	252.1	239.8	226.9	201
57	123.5	117.4	111.3	98.9	170	271.6	258.0	244.5	217
58	124.4	118.2	112.0	99.6	180	289.1	274.9	260.1	231
59	125.3	119.0	112.8	100.3	190	307.7	292.1	276.9	246
60	126.3	119.9	113.8	101.1	200	326.5	310.2	293.9	261
61	127.1	120.7	114.4	101.8	210	349.3	331.9	314.3	279
62	128.2	121.8	115.3	102.6	220	373.0	354.4	335.7	298
63	129.1	122.6	116.2	103.3	250	439.5	417.6	395.6	351
64	130.1	123.5	117.1	104.1	300	577.3	548.2	519.6	461
65	131.0	124.4	117.9	104.8	350	743.0	705.8	668.6	594
66	132.1	125.5	118.8	105.8	400	945.8	898.5	850.8	756
67	133.0	126.4	119.7	106.4	450	1181.0	1121.0	1063.0	944
68	134.0	127.3	120.5	107.2	500	1470.0	1396.0	1323.0	1176
69	135.0	128.3	121.5	108.0	550	1798.0	1708.0	1619.0	1439
70	136.0	129.3	122.3	108.8	600	2181.0	2072.0	1962.0	1745

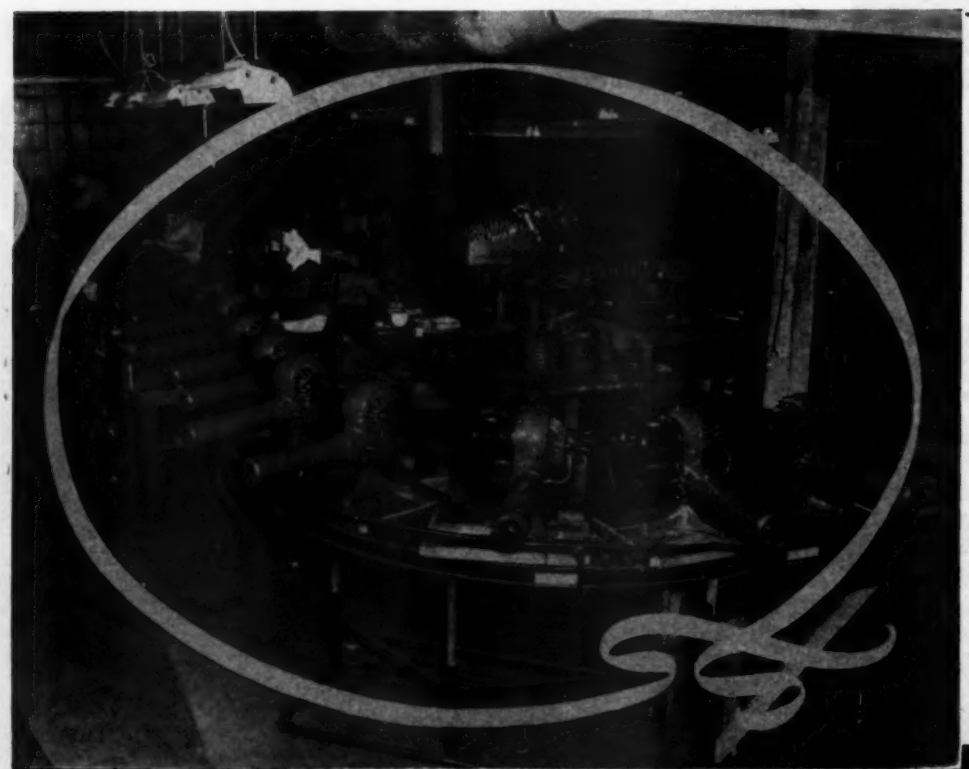
[a]These factors are calculated from the formula

$$q_r = \epsilon \left(\frac{0.173 \times T^4}{100{,}000{,}000} \right)$$

where

q_r = total radiation, Btu per (sq ft) (hr)
ϵ = emissivity.
T = absolute temperature, degrees Fahren

Table for use in determining surface radiating rate per square foot of area.



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The Nu-Way Corporation
Quality Oil Burners Since 1921, Rock Island, Illinois

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In blowers just as in anything else the emphasis is on quality. You're certain of the finest performance on the most exacting jobs when you install Furblo Furnace Blowers. These superior blowers are equipped with quiet, long hour duty motors that are rubber mounted and meet all power company requirements. With automatic overload cut-out protection, Dustop filters, Minneapolis-Honeywell controls and a variable speed V-belt, Furblo blowers enable you to meet every demand for constant economical, efficient service.

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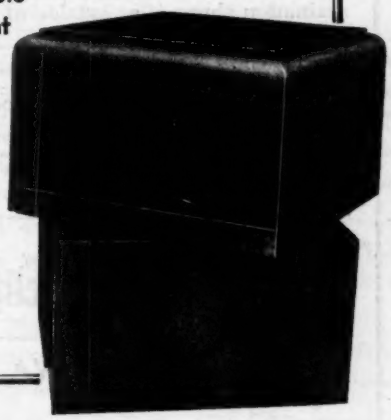
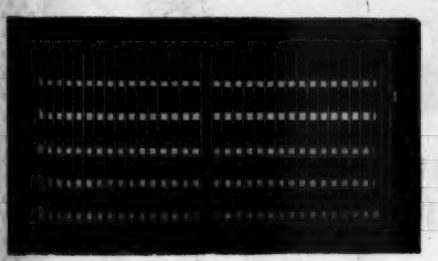


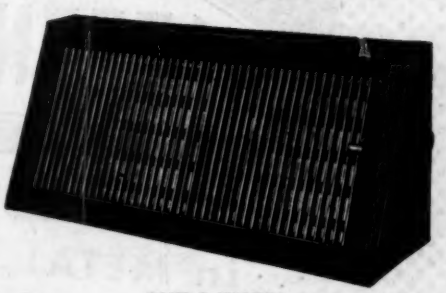
The ROCK ISLAND LINE



No. 802 AIR-VANE Forced Air Register

AIR-VANE REGISTERS

Air-Vane Registers constructed with vertical or horizontal Vanes for right or left or downward Deflection of Air Flow. Multi-louvre dampers for closing and 15 degree downward directional air flow standard. Also available with single louvre in Wall and Baseboard registers. Grilles and Intakes in all standard Warm Air pipe sizes. Large and Special sizes furnished promptly.



OUT-O-WALL REGISTER

NO-STREAK and OUT-O-WALL REGISTERS

For Gravity Lines. Available in standard sizes; also in narrow floor projections for second floor stacks; also Forced Air Sizes.

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Benda-Vane Registers are made in Single Valve and Multi-Louvre types. Available in sizes for all standard Forced Air and Gravity Size Registers.

Inset below shows simple adjustment of vanes with special tool furnished.

NO. 200 SERIES—No-Streak Bar Design. First Floor One Way

Above, and Floor and Ventilating Registers and Grilles in several designs and styles.

COMPLETE CATALOG INFORMATION ON ALL PRODUCTS FURNISHED ON REQUEST.

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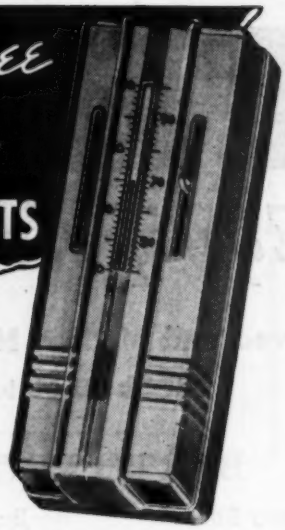

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Approved by Anthracite Industries Laboratory

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Direct orders accepted when accompanied by wholesaler's name.

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AUBURN, N. Y.
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ceiling must, therefore, radiate heat at the rate of 115 + 38.9 or 153.9 Btuh. per sq. ft. and the tem-

TABLE 2. TOTAL HEAT EMISSION BY RADIATION[a]

Body or Mean Radiant Temperature Deg F	Radiation in Btu per square foot per hour emitted to surroundings with a temperature of absolute zero by bodies at various temperatures and with emissivity factor ϵ				Body or Mean Radiant Temperature Deg F	Radiation in Btu per square foot per hour emitted to surroundings with a temperature of absolute zero by bodies at various temperatures and with emissivity factor ϵ			
	ϵ 1.00	ϵ 0.95	ϵ 0.90	ϵ 0.80		ϵ 1.00	ϵ 0.95	ϵ 0.90	ϵ 0.80
30	99.7	94.7	89.8	79.7	71	137.0	130.1	123.3	109.
35	103.9	98.7	93.6	83.1	72	137.9	131.0	124.0	110.
40	108.0	102.8	97.2	86.4	73	138.9	132.0	124.9	111.
45	112.5	106.9	101.3	89.0	74	140.2	133.1	126.1	112.
46	113.3	107.7	102.0	90.8	75	141.6	134.4	127.4	113.
47	114.3	108.6	102.9	91.5	80	147.2	140.0	132.5	117.
48	115.2	109.5	103.8	92.3	85	152.9	145.2	137.6	122.
49	116.0	110.3	104.5	92.8	90	158.5	150.5	142.7	126.
50	116.9	111.0	105.3	93.6	100	170.3	161.7	153.2	136.
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55	121.7	115.5	109.4	97.3	150	238.0	226.1	214.4	190.
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64	130.1	123.5	117.1	104.1	300	577.3	548.2	519.6	461.
65	131.0	124.4	117.9	104.8	350	743.0	705.8	668.6	594.
66	132.1	125.5	118.8	105.8	400	945.8	898.5	850.8	756.
67	133.0	126.4	119.7	106.4	450	1181.0	1121.0	1063.0	944.
68	134.0	127.3	120.5	107.2	500	1470.0	1396.0	1323.0	1176.
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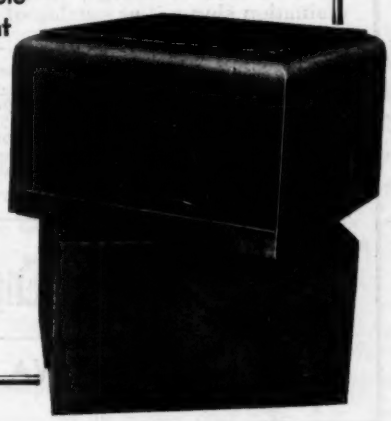
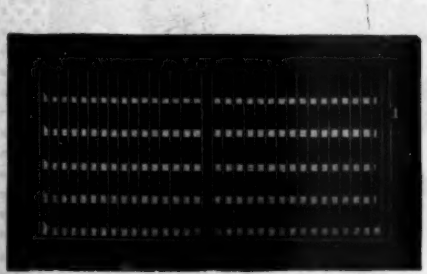


The ROCK ISLAND LINE



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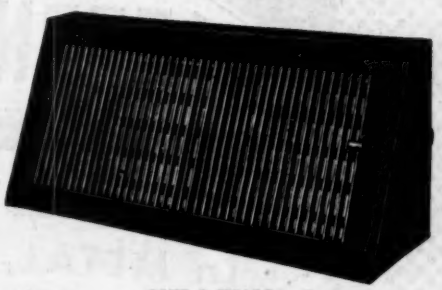

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DELAVAN Engineering Co.

DES MOINES, IOWA

perature must be $(100\sqrt[4]{153.9/0.156}) - 460$ or 101 F.

Instead of calculating these values, they can be taken directly from Table 2, p. 768, 1945 ASHVE Guide.

Step 4—The flow of heat from the air into the ceiling was assumed at the rate of $.06(110 - 30)$ or 4.8 Btuh. per sq. ft.; the air-film resistance is 0.61 and the temperature drop through the film is 0.61×4.8 or 3 degrees; the mean temperature of the air in contact with the ceiling must then be $101 + 3$ or 104 F. instead of 110 F. as assumed above. The assumption of 110 F. was on the safe side and the calculations based thereon need not be revised.

Step 5—The temperature drop of the air as it flows through the room may be assumed at pleasure, for example, 10 degrees. The air must then enter the room at 109 F. and leave at 99 F. In cooling from 109 F. to 99 F., every pound of air will emit 2.5 Btu.; hence, the air must flow through the room at the rate of $13{,}000 \div 2.5$ or 5,200 lb. per hr. or 87 lb. per min., or $87 \times 1{,}000 \div 75$ or 1,160 cfm.

It is necessary to move the air along the ceiling of the room with a high velocity and, consequently, with a low temperature drop, in order that the ceiling will be at a uniformly high temperature throughout its extent. If the air were moved with a low velocity and, consequently, with a high temperature drop, a portion of the ceiling surface would be too cool to function as a heating panel.

Step 6—In a room as large as that shown in Fig. 4, it is advisable to provide two supply ducts placed in the interior wall. The return ducts should be thoroughly insulated to reduce to a minimum the flow of

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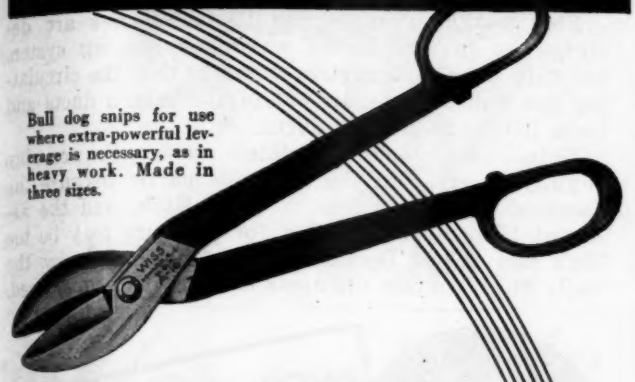

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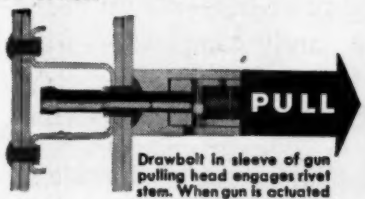

Drawbolt in sleeve of gun pulling head engages rivet stem. When gun is actuated drawbolt pulls stem into rivet, upsetting shank and forming tulip head at rivet tail.

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G35 Manual Gun

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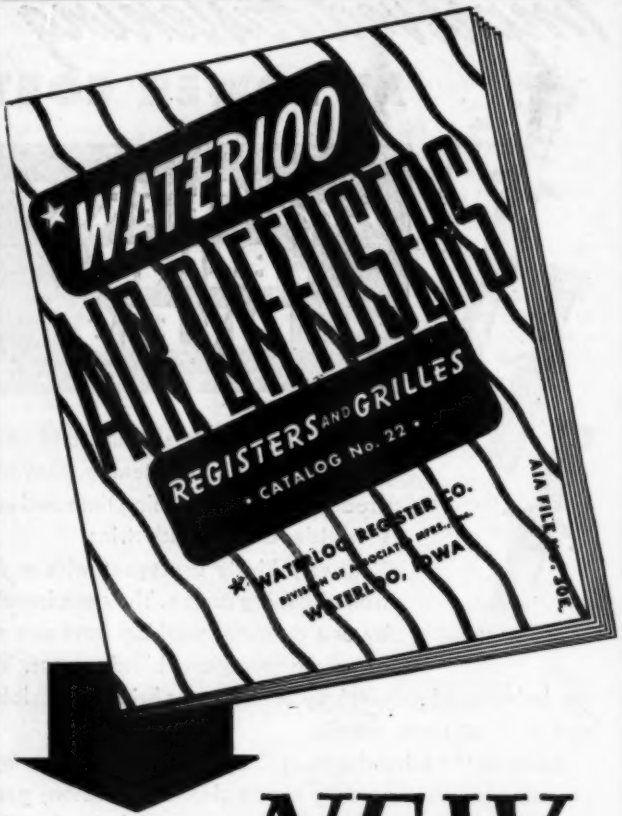
Cherry Rivet Company

LOS ANGELES 13, CALIFORNIA

heat to the exterior. The supply ducts need only have the ordinary insulation since all heat lost by those ducts will be delivered to the adjacent rooms. The four ducts should be placed so as to secure a uniform distribution of the warm air over the ceiling. In other respects the duct system is designed as customary in other warm-air heating systems.

Step 7—The furnace and its auxiliaries are designed as in any forced warm air heating system but with the return system closed so that the circulating fan will pull the air out of the return ducts and force it into the supply ducts.

Note.—The values calculated above are probably slightly in error on the safe side partly because the assumed ventilation loss of 2,900 Btuh. and the assumed 15 per cent addition for exposure may be too high and partly because the heat radiation by the walls which contain the ducts has not been considered.



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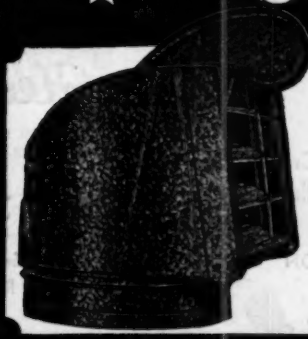

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The revolutionary new type roof ventilator that can be applied in single units, like the Rotary or Airjector, or in continuous installations. Only 32 inches high.

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Now you can learn the advantages of famous Rubyfluid paste and liquid soldering flux . . . the way it properly conditions metals and wets out freely; makes stronger, neater joints; produces no harmful fumes. Send 25c in coin or stamps for generous trial supply of paste and liquid flux.

RUBY CHEMICAL CO.
77 McDowell St. Columbus 8, Ohio

Rubyfluid

Pressures Required For Press Brake Bends

(*Continued from page* 167)

is obtained by the metal being drawn out or expanding. An added expansion to the metal in this area takes place when the points of the dies press the metal into the sharp angle formation. The flow of metal into this area continues from the edge portions of the strip, but it is cut off by the formed seats in the metal from the area between the seats, necessitating a draw of the metal into the ½ of the sharp angle. A similar process takes place in the dies in Figure 12, the seats here forming quicker, and more securely, so that the dimension between the seats must be formed of metal that "expands" into the cavities in the dies.

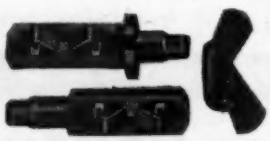
Figure 14 depicts what happens to metal formed in dies shown in Figure 13. Here, three seats are formed simultaneously, and although metal "flow" from the edge-portions of the strip continues, the metal will not flow past the formed seats. The portion between the seats must expand to reach into the cavity in the male die. This one-stroke formation calls for a pressure past the 300-ton (in 20 gauge steel 8 feet long); it can be made in three strokes of the press by 60 tons, almost as uniformly smooth. And if we can use the strip so formed, with the angles made on the common radius, we need only a 20-ton brake pressure.

In any design of a sheet metal formature that is to be made in a press brake, in dies specially made for the one-stroke operation, the practicability of the flow of the metal over the working area of the die is a

E-Z-ON . . . *The Popular* DAMPER REGULATOR
for Heating Systems . .

- Uses less Critical Materials
- Cuts Installation Time in Half
- Easy to Install with Unskilled Helpers
- Makes attractive, rattle-free job

Standard E-Z-ON



No. 27. ⅜ inch bearing. Solid end tail piece.

Simple to Install . . .

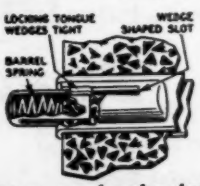
The E-Z-ON is a favorite of sheet metal men everywhere because of the time it saves on every installation. Any man who can swing a hammer can install it. Just slip the regulator over damper edge with prongs over scribed center line. Lay assembly on block of wood, and drive prongs through the sheet metal, then turn over and clinch prongs. Prongs are strong enough to pierce 20-gauge metal.

Snap-Tite E-Z-ON with Retractable Tail Piece

No. 29. ⅜ inch bearing. Tail piece with snap end bearing.

This IMPROVED E-Z-ON with Retractable Tail Piece avoids any need for bending the damper or springing the pipe to insert the damper. Just attach the same as the Standard E-Z-ON, then insert the head piece through one end, slide the Snap-Tite Tail Piece over the opposite hole and it automatically snaps through the hole and LOCKS, free of rattle.

E-Z-ON Retractable Tail Piece with Patented Locking Feature



The locking tongue and wedge shaped slot is a patented feature of the Snap-Tite that makes it superior to other snap end bearings. When movable bearings snaps out through pipe hole upon installation, the lug or locking tongue wedges securely in the tapered slot and avoids all chance of rattle, firmly locks into position.

Save labor, time and money on Damper Installations . . . with E-Z-ONS. Jobbers everywhere stock them.

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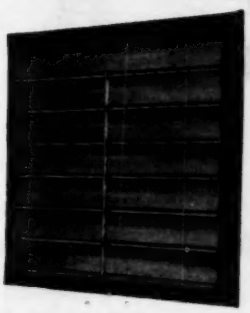
Swivel-joint with special shoulder rivet. No wear or rattle. Good for the life of the shutter.

More sensitive than any other automatic shutter, and longer lasting. Sizes from 10" to 60" square—also rectangular.



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The new SUN ELECTRONIC GAS FURNACES will be available about July of '46. An all-steel line of gas units employing the new *Electronic Instantaneous Ignition* principle as applied to injector type gas burners . . . No pilot flame . . . Clean . . . Efficient . . . Entirely automatic!

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most important factor in determining pressures. This is almost as important as is the number of compressions of the metal into areas smaller than two thicknesses of the metal worked. While sharp compressions will call for most of the pressure, the drawing-out of metal between two or more seats formed in the metal come next in pressure-requirements. Although the metal will draw much easier than it will compress, the process still calls for pressures past the common capacity of a brake, and unless we work short pieces of the metal only, we may overload and damage the brake.

News Items . . . . . .

Hershell Larsh, age 48, Larsh Sheet Metal Works, of Indianapolis, Indiana, died on July 5, 1945.

Mr. Larsh was a foreman at Sink & Edwards until about 15 years ago, when he established his own shop, doing industrial sheet metal work.

◆

James F. Prewett, sheet metal and roofing contractor, died at his home 594 Goodman, Memphis, Tenn. He was 60, native of Water Valley, Miss., and came to Memphis in his youth. His wife and two sons in the army service survive.

◆

The sons of the late Jacob Bailen, associated with their father for a number of years, will continue the operation of J. Bailen and Sons, Roofing and Sheet Metal, located at 1135 S. 2nd Street, Louisville, Ky.

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Revolutionizes DUCT INSTALLATION
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LOW INSTALLATION COST—SIMPLE "ONETRIP" BALANCING

Conserve your manpower! UNIDUCT easier, simpler installation requires less manhours—enabling you to make more installations, more profits with your present manpower.

One Trunk for both warm and cold air!
One Register for both warm and cold air!
One Stackhead for supply and return!
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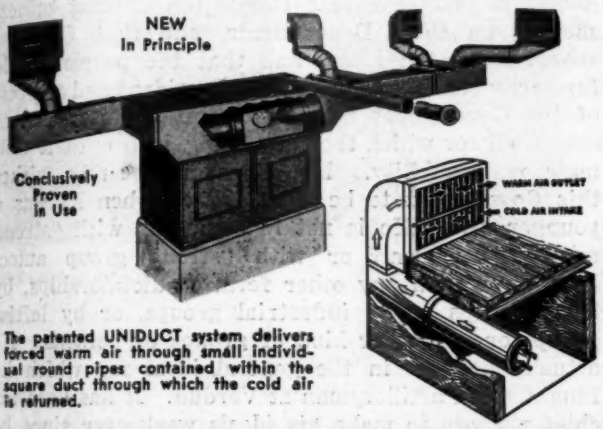

The patented UNIDUCT system delivers forced warm air through small individual round pipes contained within the square duct through which the cold air is returned.

Easily installed in old or new houses.
More Even Temperature—more floor space.
Minimizes combustion and mechanical noises.

HERE IS A TYPICAL LETTER FROM A USER

We have installed over one hundred UNIDUCT Systems and can honestly say every single one is operating perfectly.

"Fifty-two years' experience in installing furnaces has made us very familiar with the problems of forced air heating. The two greatest benefits we have found in the UNIDUCT System is that drafts and difficulty in balancing are completely eliminated. All rooms heat evenly. There are no cold corners or drafty spots."

(Signed) E. Kluegel & Company, St. Paul, Minn.

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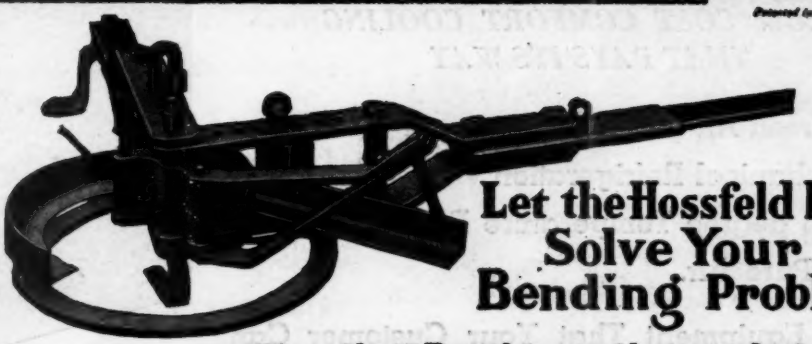
The HOSSFELD UNIVERSAL IRON BENDER
"WRENCHLESS TYPE"

Patented in the U.S. and Canada

Bends Pipe, Bars and Angle Iron



Let the Hossfeld Bender Solve Your Bending Problems

No other Bender on the market like it.

Samples of Bar Bending *Samples of Pipe Bending*

This Powerful, Steel Constructed, Wrenchless, Universal, Pipe, Bar and Angle Iron Bender, will neatly, quickly and accurately turn out most any kind of a bending job that ever comes up, either in maintenance or production work — such as Eye Bolts, "U" shapes, "S" shapes, Links, Circles, Offsets, Braces, Cranks, etc. It will also roll eyes on flat stock for Automobile Springs and the like.

It does a perfect job on Pipe work, bending to any degree or to a continuous coil without flattening it or splitting the seam.

The bending of Angle Iron is an exceptionally wonderful feature of the machine. It forms a smooth perfect curve or circle of any radius desired, without twisting or distorting the stock in the least. It also bends Sharp Square bends on notched Angle Iron.

The machine is built in two sizes. The larger size bending up to 2-inch standard pipe, 4½-inch flat bar stock, or 2x2x⅜-inch angle iron, cold. There are thousands of these machines in use by all classes of trade in the U. S., Canada and other foreign countries.

Write for descriptive literature and prices.

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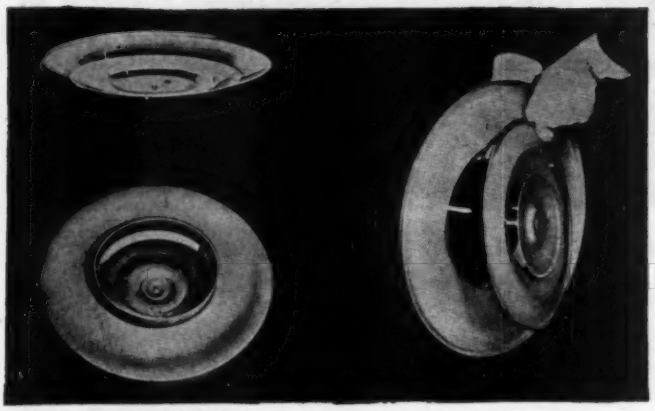
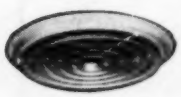


AGITAIR DIFFUSERS
are easy to install

TYPE CSF (Top)

TYPE R



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Because of their simple, functional design, Agitair Air Diffusers can be installed tightly and "in line" with a few simple fastenings and a minimum of duct work.

Efficient Agitair venturi-type orifices forcibly mix high-velocity incoming air streams with large volumes of room air, and create draftless circulation of air that leaves no hot or cold spots.

Write for Agitair Diffuser Data Book.

AIR DEVICES, INC. 17 EAST 42nd STREET NEW YORK 17, N. Y.

21-D

Kruckman—Dep't Of Commerce

(Continued from page 115)

gossip is that the powers-that-be have made their peace with Dr. Taylor, and that he is ready to step down without appeal to Congress when the Executive Order may be issued.

Truman Wants Constitutional Gov't

What Mr. Truman may do is still uncertain. His instinct is to do the Constitutional thing. He has endeavored to nudge the Government back to pre-Roosevelt practices. He thinks the Cabinet officers should run their Departments, and that Congress should make the Laws, and that the people should forcefully tell Congress and the President and the rest of the Government how they want the Government conducted for which they pay, and which is their ultimate responsibility. Mr. Truman sincerely wishes this Government to be what it was when he was a younger man. He is not in sympathy with "strong man" Government, or with "strong group autocracies," or with any other form of dictatorships, by labor groups or by industrial groups, or by leftist groups or any other kind of groups or persons. He actually believes in the general ideal for which he fought as an artilleryman at Verdun. It has been his chief purpose to make his ideals work ever since he came into the White House.

AIR-CHAMP EVAPORATIVE COOLERS

—LOW COST COMFORT COOLING THAT PAYS ITS WAY

- 100% Fresh Air
- No Mechanical Refrigeration
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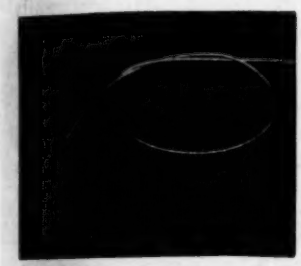
YOU PROFIT—in longer wear, greater brush value per dollar, better work—when you insist on SCHAEFER BRUSHES. Research, skill, and long experience have developed the correct brush for every industrial and domestic use.



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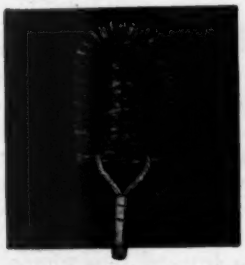
"Silver Brite" Rustproof Steel Furnace Brush, built for hard, long-lived service. Of special-alloy rustproof spring steel wire, with double-twisted flexible wire stem.



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One of the most useful and popular brushes ever made. Of oil-tempered round steel wire, twisted in heavy stem wire, secured in ¼" threaded nipple.

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Available in two styles—round with black tempered round wire, or oblong with flat tempered steel wire—designed for efficient cleaning and long service. 6" to 12" diameters.

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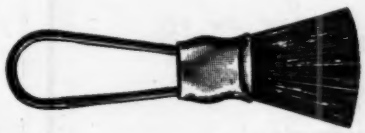
Made for production buffing and other industrial uses. Heavily filled with crimped steel wire firmly fastened between two steel plates. Offered in several sizes, or made to order.



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For roughing, soldering, and many shop and service uses. 6" long, with tempered steel wire trimmed 1½".

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Tin ferrule acid brushes of selected black China bristle firmly secured.

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Truman's Job Is Tough

He had no illusions about his capabilities or how far he might be able to go at the White House. He thinks of himself as a man with good training and capacities as a Senator, and as inadequately prepared for the Presidency. He strove with all his might to avoid nomination as Vice President, and deeply regretted the loss of his job as Senator, and never expected to become President. He had no real opportunity to get close to the machinery of the Presidency in the few months that preceded his sudden induction. He thinks something should be done to help the potential President to be better prepared for the job he may have to take over. When he went to the White House he thoroughly realized the time was ahead when the brickbats would fly towards the White House. He himself had wondered how FDR would manage to preserve his popularity and leadership when the reverses of peace inevitably developed. He apparently thought his old friends on the Hill would help to smooth the way. If he feels sore over the way they have acted he is certainly never personal in his comment. His effort today is to preserve the pre-war Democracy, to avoid all inclinations to "strong" governments of the left or right or any other kind that savor of too much concentration of power in groups or persons. He apparently thinks the effort to steer an honest course will eventually register with the people; and it is almost certain he is now far less concerned with his prospects in 1948 than the prospects of guiding the United States into less troubled waters. He realizes the implications of the strikes are social and political probably even more than economic. Like many more of us he apparently feels the Veterans

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You can't compete for big OR little jobs today unless you own a Pittsburgh Lock Machine. But why be in the dark about the best machine to buy? Simply send for full details about the No. 422 "Riverside" . . . and actual metal sample of its work! See for yourself the clean, open-throated lock this machine turns out. Discover its many features that mean dependable operation and long life. Capacity up to 22 gauge. Simplifies and speeds up making Pittsburgh locks, double seams, drive cleats and straight flanges. All rolls removable. Send name and address TODAY for full details and actual sample.

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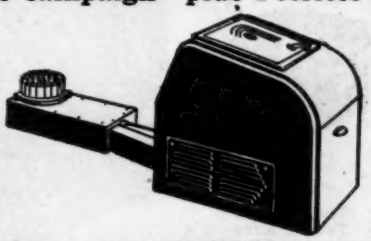
PEERLESS FIRE-GUARD DISTRIBUTORSHIPS are built on a solid foundation of fair business practice and mutual understanding. No sales quotas nor other *Jokers* in the Peerless franchise. Each Distributor displaying the Peerless Banner is guaranteed full and complete protection throughout his entire territory which is assigned only with every expectation of permanency. These conditions combined with a sensible sales campaign - plus Peerless co-operation - and - plus the existing public demand for the Peerless Fire-Guard Stoker assure Distributor success.



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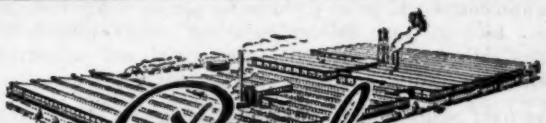

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SINCE 1884

might be a great stabilizing influence when they once settle down, and when they find their leaders.

Controls May Be Reinstated

There are many indications that the leaders of the Government feel the rush to abandon controls was hasty, and has led to confusion, muddle, and the lack of materials to do complete jobs. The unbalance in supply is regarded as deeper than merely the immediate scarcities. It is believed to flow from the breakdown of the world's finely articulated and poised economic machine; and it is felt this machine cannot be restored to full operation until all parts, including enemy countries, are integrated in the place they are to occupy. Washington begins to see that the whole system is interdependent, countries linking up with countries, raw materials being related to techniques and to transport; and the processing and fabricating being involved with finance, insurance, with warehousing, with distribution, and marketing, down to the ultimate retailing.

It appears to the people in the Capital more and more obvious that the hysteria of war must be allayed, that some over-all effort must be made to get beyond the emotions, and that some plan must be devised quickly to inspire a rough global unity, based upon reason, to begin the work of over-all restoration. Until this way is found it is felt the present turmoil and confusion and lack of coordination and order, will persist; and the men on horseback will continue to make passes at political power.

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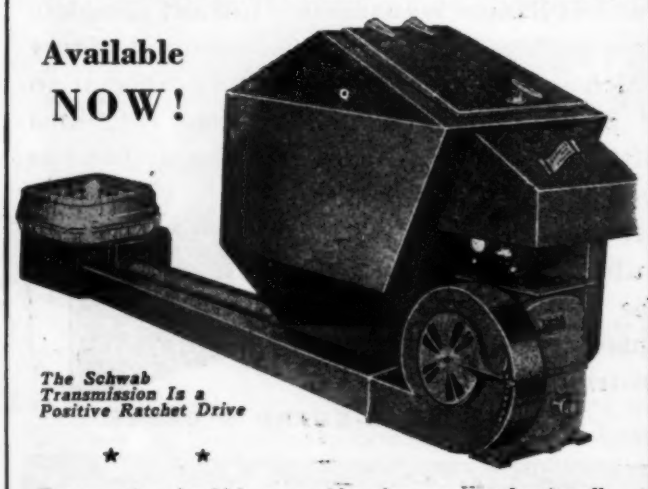

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We're right behind you on every installation, too. The Schwab power unit is made *here* . . . by us . . . and we can always take care of any repairs or adjustments that might arise.

Do yourself a favor . . . write today for further information.

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81 years of continuous Manufacturing Experience

5 to 12 in.

These Illustrations Show the Patented Construction of a Janette Wheel. The blades are formed in pairs for rigidity. The blade slots in the steel discs are die cut to ensure exact spacing of the blades. The hub is riveted to the back plate; then the blades are inserted into the slots. After the blades are spot welded to the back plate the tips are pressed thru the slots of the inlet disc, then rolled down against the disc.

The Inherent Spring of the Blades Keeps Them Tight.

Because of This Construction, Janette Wheels have given over 19 years of universal satisfaction to internationally known manufacturers of coal stokers, blowers, ventilating equipment, air cooled engines, oil burners, superchargers, , dust collectors, drying and fire detection apparatus. **It Will Pay You to Give Janette Blower Wheels a Trial!**

May We Send Literature?

Janette Manufacturing Company
556 W Monroe St Chicago 6

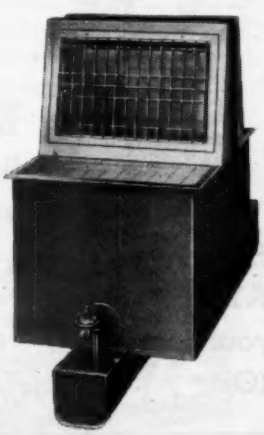
THE ONLY "DUAL" YOU CAN EASILY INSTALL FROM ABOVE THE FLOOR

HOLLY Stubby

FOR THE FIRST TIME you can install a dual floor furnace *from above* the floor by merely cutting the hole to the exact furnace size—in either new construction or for remodeling. Then slip the STUBBY into place from above the floor.

Holly's many patented features make this possible. For example the removable, watertight burner pan contains all operating units and is easily installed or removed for service.

The Holly STUBBY completely eliminates the cutting of a trap door, cutting floor holes oversize, patching floors and walls, building a pit and dragging a furnace *under* the house for installation.



STUBBY'S installation advantage is but one of 7 big Holly features that make this furnace *easier for you to make more money.*

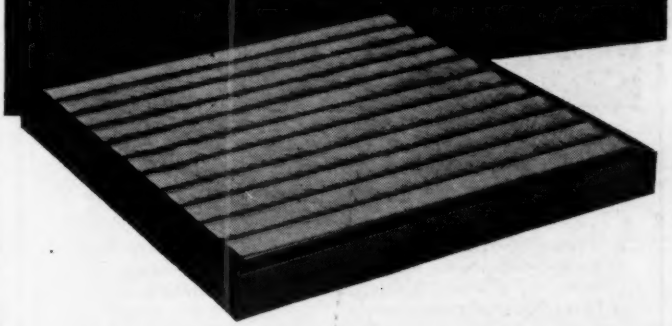
Holly STUBBY
Dual floor furnace

HOLLY MANUFACTURING COMPANY

175 ARROYO PARKWAY • PASADENA, CALIFORNIA

25%

GREATER FILTERING SURFACE . . . . . .



MAKES THIS NEW PATENTED BADGER GLASS-FIBRE AIR-FILTER THE MOST EFFECTIVE EVER DESIGNED . . . . . .

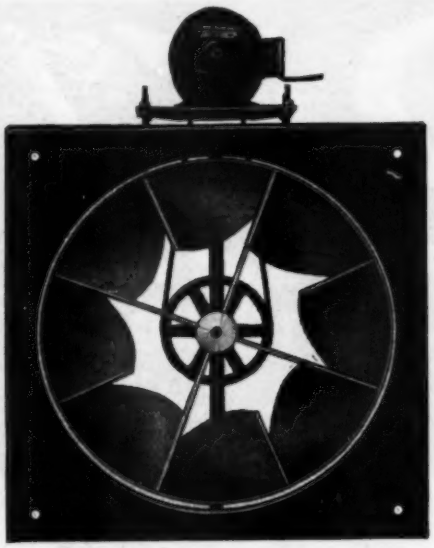
Note these OUTSTANDING Features:

- ★ A dry filter . . . Replaceable type.
- ★ Ribbed construction on both sides of the filter insures complete air filtration—with 25% greater filtering surface.
- ★ LIGHT in weight, long life is assured by rigidity and sturdiness of strong cardboard frame firmly cemented to exclusive rib structure.
- ★ Special flange design assures perfect air seal.
- ★ Fixed Glass-fibre media will not slide, pack, swell or settle.
- ★ Fire-resistant, odorless.
- ★ Available in all standard sizes.

Order BADGER Glass-Fibre Air Filters through your local jobber. Or write direct.

Badger CORPORATION

Milwaukee 2, Wisconsin



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ANNOUNCING:—

The "New Triumph" Exhaust Fan.

The result of fifty years of fan development. New and patented features increase capacity and decrease air noise. The open center construction practically eliminates hub turbulence.

Bulletin with full details will be ready soon.

INDIANA FAN COMPANY

40 E South Street Indianapolis 4, Ind.

Chicago's G.I. Apprenticeship Plan

(*Continued from page 109*)

All other conditions to remain in conformity with the spirit and intent of the Sheet Metal Apprenticeship Standards as carried out in the regular apprenticeship training.

The provisions herein contained, to be printed as a separate form to meet the emergency and the economic environment, affecting discharged veterans and ex-service men from the United States armed service into the readjustment of civilian occupation.

Respectfully submitted,

ROY M. MOFFITT, Chairman

WM. A. KUECHENBERG GEORGE KALVOG

L. V. BURGHOFFER JAMES D. RYAN

Report of Subcommittee on G. I. Apprentices

The recommendations of the subcommittee, which were approved by the Joint Apprenticeship Committee on May 9, 1945, covered the following four differences from the standard apprenticeship procedure:

1. Wages for the first year will be $1.00 per hour, second year $1.10 per hour, third year $1.25 per hour, and fourth and final year $1.40 per hour.
2. The apprentice is to attend school two nights per week during the school term on his own time, his schooling to continue until he has passed a satisfactory examination.
3. The apprentice shall make twenty fittings per

Speed Up Orders With a

BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

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SHEET METAL MEN should know more about this machine

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Metal Cutting Band Saw

SAVES EVERY DAY in your SHOP

Why let high priced labor cut by hand —lengths of angle iron—rods—tubes—bars, etc.—when this low priced machine does these jobs with amazing Speed and Accuracy? Pays for itself in Labor Saving and Steps up Production. Scores of shops say "just what we've always wanted."

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MACHINE TOOL DIVISION

Kalamazoo Tank & Silo Co. — Kalamazoo 16, Michigan

for BETTER PRODUCTION and MAINTENANCE

at Lower Cost

A proved time-saver in any sized shop. Libert's *flexibility* gives you a wider variety of work—clean shearing of flat or formed sheet metal... straight or irregular shapes... inside or outside cuts. Libert *simplicity* means that even unskilled labor soon does accurate work, lots of it *and fast!* Write for Bulletin.

Made in sizes up to 60 in. throat, 10 gauge capacity

LIBERT MACHINE CO., GREEN BAY, WIS.

Libert Hi-Speed SHEAR

Sampsel
AUTOMATIC CONTROLS

BETTER CONTROLS

at better distributor-dealer profit

.... FOR LESS MONEY!

Fuel-Saving Starts With CONTROL

Sampsel builds only highest quality heating controls. Now ready in Package Units. Why not make more money for yourself—at the same time serve your customers better? Products fully guaranteed.

PROFITS *for distributors and dealers*

Right now, Controls are easy to sell. There's a big market. And Sampsel Controls give top quality at a lower price. They assure your customer of better value at No sacrifice in profit to YOU. Get details now.

★ **PACKAGE UNITS**
Complete with all accessories. Write for catalogue.

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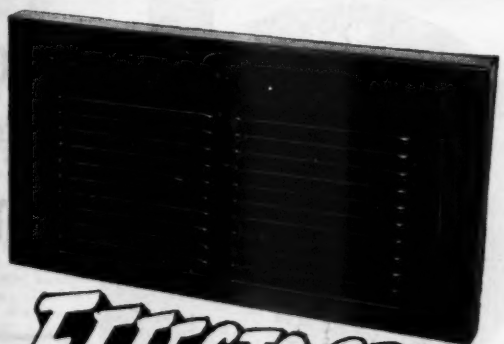
SAMPSEL TIME CONTROL, Inc.
SPRING VALLEY, ILLINOIS

We MAKE what we sell - We KNOW what we make!



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Popular Price
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HEAT
CLEAN AIR

Dealers: Join the National Association's Campaign to promote true indoor comfort through conditioned warm air.

UNION MANUFACTURING CO., INC.
BOYERTOWN, PA.

year on his own time, under his employer's supervision.

4. The term of apprenticeship shall be four years instead of five years.

All other conditions to remain in conformity with the spirit and intent of the Sheet Metal Apprenticeship Standards as carried out in the regular apprenticeship training.

The subcommittee makes these further recommendations and suggestions in connection with the administration of the Apprenticeship Plan:

1. All employers and apprentices shall be qualified only in open committee meeting by the chairman and such other members as care to question the apprentice or employer.
2. Each employer shall consider his obligation in the light of:
   1. The destiny of the apprentice and his ultimate welfare.
   2. To insist on seeing the apprentice's Army Form 100 and Discharge Certificate. This Form 100 gives a complete history of the apprentice's military and pre-military training, experience, education and skills.
   3. No apprentice should be employed prior to union approval and no apprentice is to be indentured before an approximately sixty day probationary period and the Apprenticeship Committee examination of the apprentice and qualifications of the employer.
   4. Employers should reserve apprenticeship quotas for any apprentices they may now have in the service and who must be given their former job upon their return from the service if they so request.

FEW AS GOOD — **GILTEDGE** — **NONE BETTER**

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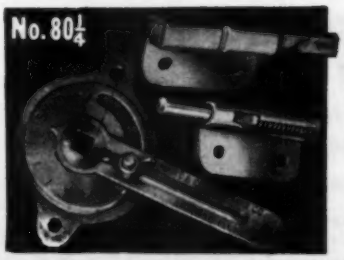
H&C DAMPER REGULATOR SETS

ECONOMY TYPE. Three ways to install: 1. With lock nut but without handle (for tamper-proof setting). 2. With handle and lock nut. 3. With handle and wing nut. Nut prevents damper vibration. Handle always indicates position of damper (Patent 2,146,142). Furnished with handy snap end bearing. Complete set in carton. Made only with ¼" bearings.

LIST PRICE.....No. 40¼S.....$0.30

BRACKET TYPE. Nut holds damper securely, preventing vibration. Handle which indicates position of damper, may be left in place permanently or removed after adjustment (to prevent tampering). Snap End Bearing on ¼" size, Solid Bearing on ⅜" size. Each set individually packaged.

LIST PRICES.....No. 50¼.....$0.40
No. 50⅜ $0.60



DISK TYPE. Like all H&C sets, this set is equally adaptable to splitter or regular dampers. Snap End Bearing on ¼" size, Solid Bearing on ⅜" size. All parts are rust proofed. Complete set in carton.

LIST PRICES.....No. 80¼.....$0.40
No. 80⅜.....$0.60

See your jobber or write for literature and sample.

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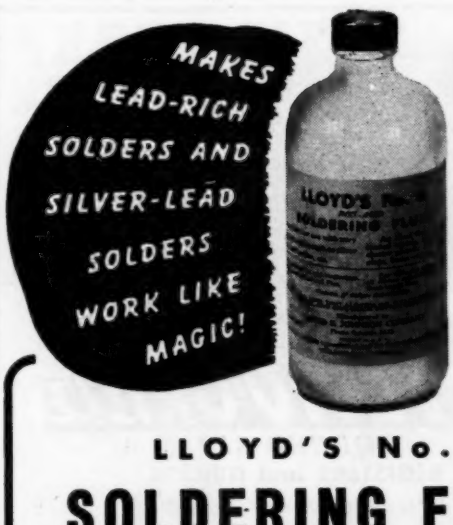
HOLLAND, MICH. • PHILADELPHIA OFFICE: 1600 ARCH ST.



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SOLDERING TECHNICIANS

Have You These COST CUTTERS in Your Plant?

MACHINES THAT NEED NO POWER

The Famco Squaring Shear (above) is an all 'round saver. Requires small investment . . . no electric power . . . it's simple to install . . . has easy gauge settings. This Famco Shear will cut up to 18 gauge mild steel. Made in five sizes: 22", 30", 36", 42" and 52" cutting widths (three largest have "hold down" attachment). All models are equipped with front, back and side gauges. Write today for descriptive folder.

Famco Foot Presses for light forming and stamping are available in 10 models (for bench or floor mounting). Low in cost.

Famco Arbor Presses, in 32 models, bench and floor mounting, will deliver up to 15 tons pressure . . . require no electric power.

FAMCO MACHINE CO., 1314 18th ST., RACINE, WISCONSIN

famco machines (COST CUTTING)

SQUARING SHEARS • ARBOR PRESSES • FOOT PRESSES

MOREY HAMMERS

Licensed Under Widman Patent

THE PERFECT HAMMER for double seaming of sheet metal — drawing rivets through sheet metal or corrugated roofing. For general use in machine, body, fender and tire shops.

The patented design of MOREY HAMMERS combines necessary weight without bulk or clumsiness to give perfect balance.

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No. 118

Combination Bench Furnaces

No forced air blast required for this handy furnace. Use it for heating largest soldering coppers, branding irons or tempering, heat treating, annealing, case hardenings or soft metal melting. Removable lid on hood permits using 22 lb. capacity melting pot.

No. 101

Powerful, efficient, economical. Gives 1800° F. without a blower. Write for details and prices.

FREE Illustrated Johnson Catalog showing complete line of furnaces.

Parts available for any Johnson Furnace built since 1901.

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FAN BLADES AND BLOWER WHEELS

BETTER FAN satisfaction is assured when you equip your fans with Burden Aluminum or Plastic Blades.

Both are overlapping semi-pressure type. Aluminum Blades mounted on cadmium plated steel hub with steel or aluminum spider. Plastic Blades mounted on steel cadmium plated hub with aluminum spider.

BLOWER WHEELS and HOUSINGS

10 Sizes Made in Both Plastic and Metal

Quietness is an Inherent Characteristic of all Burden Impellers

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BURDEN FAN and BLOWER CO.

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5. All formerly indentured apprentices returning from military service must appear before the Joint Apprenticeship Committee for the purpose of re-rating.

6. Employers are urged to consider G. I. apprentices as mature men in every sense of the word and not as school boys, as has sometimes been necessary with the younger, inexperienced apprentices. The measure of additional pay is for the purpose of more swiftly helping the returning veteran into the rehabilitation of civilian life, with the expectation that he shall recognize his duties and assist to restore himself back into industrial occupation.

3. The union must have the opportunity and will undertake the indoctrination of the apprentice, teaching him his rights, privileges and duties of union membership.

4. The apprentices will be expected to conform to the rules set up in the Apprentice Standards in relation to the union, his employer and his fellow craftsmen.

Respectfully submitted,

ROY M. MOFFITT, Chairman

WM. A. KUECHENBERG GEORGE KALVOG
L. V. BURGHOFFER JAMES D. RYAN

Majestic Heavy Duty Steel **Stoker Furnace**

For Gravity or Forced Air Systems

ENDS THE CLINKER PROBLEM!

• Specially designed and built for stoker firing • Suited for any make or type of domestic stoker • Built-in compartment for convenient dust- and gas-free clinker removal • Interchangeable panels permit placing stoker on either side • Rugged, durable, boiler plate steel construction • Leakproof electric-welded joints inside and out • A high quality, efficient heating plant at an attractive price. • *Backed by Majestic's 38 years of heating experience!*

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★ BLOWERS FOR EVERY PURPOSE

Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.

★ **CENTER DISC WHEEL**—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

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THE SCIENTIFIC GAS VENT *and* FLUE PIPE

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BOOST PRODUCTION SCHEDULES WITH

MARSHALLTOWN THROATLESS SHEARS

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CUT ANY SHAPE

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CUT ANY SIZE SHEET

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No. 18 HAND POWER

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. No matter what type of cutting—either irregular shapes or straight splitting—from ANY size sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.

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ON THE SQUARE

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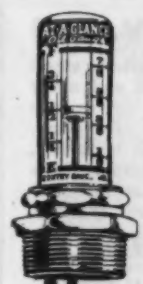

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Because

1.—It has a simple sturdy construction—no gears or intricate mechanism to go wrong or wear out.

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4.—It is attractive in appearance, and is the only gauge on the market that can be read "AT-A-GLANCE" from any direction.

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Gauges can be purchased from jobbers throughout the United States and Canada.

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TIMKEN Bearings Used Throughout

We design and build roll-forming machines and make roller dies to help you lick the toughest jobs. Discover the Dahlstrom "knack" for working out difficult problems. Send a sample or rough sketch for quotations.

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MONMOUTH HUMIDIFIERS

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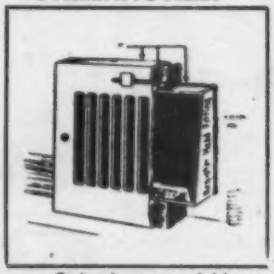

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Order from your Jobber or write for Literature and Details

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Nat'l Warm Air Ass'n Meeting

(Continued from page 176)

During the war various branches of the warm air industry, as a matter of conservation, eliminated many non-essential sizes and patterns of equipment. All of these were incorporated in the new Manuals for the simplification and at the same time improvement of installation practice.

For the first time our codes both for gravity and winter air conditioning have been combined with respective manuals of practice that cover approximately 90 per cent of our warm air heating requirements. These Manuals embody the best of available research data in very practical and easy to use forms that have an appeal to both the practical dealer and the new students we are attracting to our field.

The Textbook Sections No. 1—How to Make a Comfort Survey and How to Make Floor Plans, No. 2—How to Check Frame House Construction, No. 3—How to Figure Heat Losses, supplement and form a valuable basis for the understanding and application of Manual Sections No. 5 and No. 7. The most advanced heating engineer will also find in these sections 1, 2 and 3 excellent material for the approach to home owner, contractor and even the architect to get better understanding and more cooperation for obtaining better heating installations.

We are entering a period that has the greatest potential demand for heating equipment in our history. This is both an opportunity and a responsibility for the Association to see that good heating practice is followed by its members and the trade.

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A Definitely Better SOLDERING FLUX

FOR STAINLESS STEEL AND ALL ALLOYS

Used exclusively by many fabricators of Stainless Steel and other metals. Flows freely without rolling up. Provides even coverage. Flows through lap joints without tinning before being lapped. Forms perfect bond. Has no strong corrosive action. Odorless—no injurious fumes.
Sample for trial on request.

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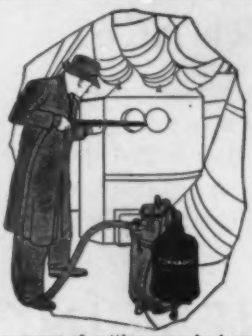

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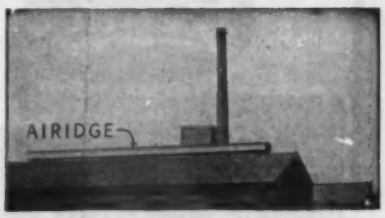
CUT ANY SIZE HOLE IN METAL·WOOD·PLASTICS

Bruno Adjustable Hole Cutter for home users, mechanics, farmers, technicians! High speed steel blade cuts clean holes quickly. Fits drill press, portable drill or hand brace. Money back guarantee! At all hardware stores or write direct, Dept. **AA-1.**

Model No.	Shank Size	Cutter Expansion Capacity	User's Price
100	1/4" straight shank	3/8"-1 1/2"	$2.95
100-S	Square Bit Stock	3/8"-1 1/2"	$2.95
101	3/8" straight shank	1"-2 1/2"	$4.95
101-S	Square Bit Stock	1"-2 1/2"	$4.95

BRUNO TOOLS Beverly Hills California

Effective Roof Ventilation



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Repair parts for Vernois Furnaces are quickly available at our plant. When you need them write use at once. You'll give the customer a better job and assure yourself a more profitable one by using only Vernois parts.

MT. VERNON FURNACE & MFG. CO.
MT. VERNON, ILLINOIS

A Type and Size for Every Need

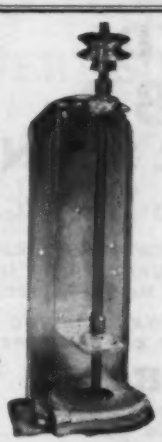
DIAL REGULATOR

UNXLD QUADRANT

JIFFY REGULATOR

For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 200 Varick Street, New York.

PARKER-KALON damper controls



MOREY
EVAPORATIVE COOLER PUMP
Drives Off Blower or Motor Shaft

SPECIFICATIONS

Ample capacity for Coolers up to and including 3500 C.F.M. Belt driven—¼" Neoprene belt and 6" sheave with 1" bore furnished. Self-aligning OILITE bearings. Brass pump and impellor. Cadmium plated stand.

PRICE $8.00—USUAL TRADE DISCOUNTS

Distributors and Jobbers Wanted

DAN MOREY
814-816 So. Robertson Blvd.
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REPAIRS FOR ANY FURNACE BOILER OR STOVE

REPAIR PARTS FOR ANY FURNACE, BOILER OR STOVE

Complete Line of Sundries and Supplies

FOR QUICK SHIPMENT

OMAHA STOVE REPAIR WORKS
1206-8 DOUGLAS ST., OMAHA 2, NEB.
SINCE 1832

Bremil

PORTABLE SHEARS

Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line.

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.

BREMIL MFG. CO.
1800 Pittsburg Ave. Erie, Pa.

The Codes Committee's next new project will be the revision of the Technical Code to apply to larger installations than those within the scope of Section 7.

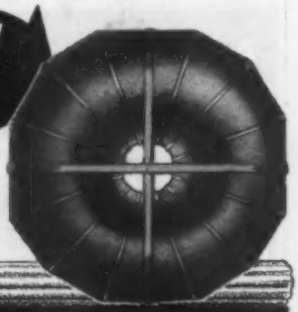
Technical Educational Committee—

The former Michigan State College Short Course Committee has been revised and renamed "Technical Educational Committee" in keeping with the expanding work of this committee. In 1946 there will be at least two short courses offered—one at Michigan State College, East Lansing, Mich., and a second at Syracuse University, Syracuse, N. Y.

The committee hopes to establish more short courses in more universities in all parts of the country as time goes on. Also, the committee believes that these short courses can perhaps become a training course for men who will teach dealer schools.

IMMEDIATE DELIVERY
FROM STOCK!

ELBOWS & SMOKE PIPE...
CONDUCTOR PIPE TOO!



KRAUSER-BOYD, INC.
553 RIVER ROAD · N. TONAWANDA, N. Y.

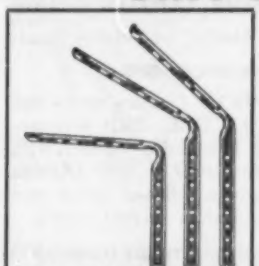
Leader

KOOLSTACK FURNACES
FOR STOKERS
OIL or HANDFIRED
50,000 to 200,000 BTU's

Patented Damper Uses All the Heat in the Added Heating Surface
THAT IS SOMETHING TO SELL

LEADER IRON WORKS, Inc.
Decatur Illinois

IMPROVED!



PAT. APPLIED FOR

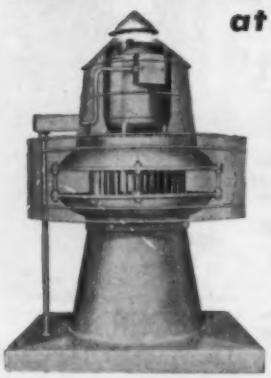
•BB•
No. 12 SHANK
33⅓% STRONGER

IMPROVEMENT IS APPLIED TO No. 15—SQUARE, No. 12—⅛ PITCH, AND No. 25—¼ PITCH.

SOLD THRU LEADING JOBBERS EVERYWHERE

BERGER BROTHERS CO.
Main Office & Factory
229-237 Arch St., Philadelphia, Pa.

MOVE 30% MORE AIR
at less power cost!



Here's a new idea that revolutionizes ventilating . . . the Air-Van Power Exhauster moves 30% more air at less power cost!
Accepted everywhere for its phenomenal performance, superior design and splendid construction, the Air-Van Power Exhauster is your answer to all ventilating problems! Write for complete details today.

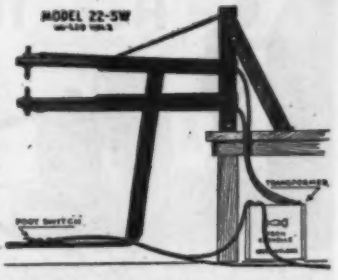
THE GALLAHER COMPANY
OWATONNA, MINNESOTA

DASCO
Forged
HAND TOOLS

Chisels, punches, drills, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.

DAMASCUS STEEL PRODUCTS CORP., ROCKFORD, ILL.

FERN
Klondike Spot Welder
Model 22SW Bench Type



Operates on any ordinary 30 or 60 amp. electric service. Spot welds 20 gauge or lighter metal, cold-rolled steel, hot-rolled steel (Clean, Pickled), Stainless Steel, Nickel Plated Steel, Nickel Alloys, Monel Metal, Silicon Bronze Type Alloys, Pure Zinc and Nickel Silver, Unpickled Hot-Rolled Steel, Aluminum and its Alloys, Tin Plate, Terne Plate, Chrome Plate, Galvanized Iron and other coated materials. The Fern Klondike Spot Welder costs but a third of other spot welding equipment but does the work of machines which cost three times as much. This equipment can be transferred from job to job or can be used on a bench in shop. Can be purchased in an 18 or 20 inch throat, very simple to operate.

RALPH FERN
2517 Boulevard Ave.
Scranton 9, Penna.

30 Degree Branch Patterns Now Available

ELBOW PATTERNS IN TWO SETS
SET No. 1—1" to 20" in 2-3-4-5-6-7 piece, including T PATTERNS 2" to 20"—152 Patterns $2.50
SET No. 2—20" to 40" in 5-6-7-8-9 piece, 105 Patterns including elbow chart, showing what pattern and number of pieces for required angles, also gives the distance between seams in throat for any required radius up to 96".
SETS No. 1 and No. 2 postpaid $5.00

30 and 45 Degree BRANCH PATTERNS IN TWO SETS as follows:
SET No. 3—2" to 12" on 2" to 30"—190 Patterns $5.00
SET No. 4—12" to 24" on 12" to 48"—195 Patterns $5.00
SETS No. 1-2-3-4 cover everything in blow-pipe work. Patterns sent by return mail post-paid upon receipt of P.O. order or check for $15.00.

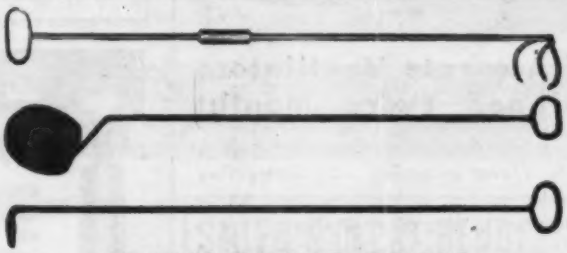
G. L. GRAY • P. O. BOX 520 NEW HAVEN 3, CONN.

Write for pattern circular giving full information. Mention American Artisan.

1. "FITRITE" ROOF STRAINERS
2. "FITRITE" BRONZE BEEHIVE STRAINERS
3. "FITRITE" SKY-LIGHT GEARING
4. "FITRITE" Adjustable Swing Chimney Jack Frame
ADJUSTABLE PIPE SNOW GUARDS
5. "PROTECTOR"
6. "FITRITE"
Write Dept. A for prices.
To protect trade use your printed stationery.
DAVID LEVOW
308 West 20 St
NEW YORK

"RIVAL" and "FITRITE" Ornamental Leader Straps
COPPER & ZINC
in 6 Styles
Write for folder and free samples.
Sold through Jobbers only.

A NEW DIFFERENT
POST WAR APPLIANCE
FOR THE HOME
THE JENNINGS TRANSFER MECHANISM
IT IS NOW POSSIBLE TO HEAT THE HOME AND DOMESTIC HOT WATER WITH
ONE OIL BURNER
AUTOMATICALLY CONTROLLED — YEAR AROUND SERVICE
AIR OR WATER HEATING SYSTEM.
FREELAND L. JENNINGS
LIMA — OHIO



ADAMS FIRING TOOLS
CLINKER TONGS — FURNACE POKERS
ASH REMOVERS — FIRE RAKES
FIRING HOES
Buy Adams Known Quality
THE ADAMS COMPANY
BRIDGE STREET — DUBUQUE, IOWA

CLASSIFIED ADVERTISING

5 cents for each word including heading and address. Count seven words for keyed address. Minimum $1.00 for each insertion. Cash must accompany order. Copy must be in our hands by the first of the month of issue.

HELP WANTED

ENGINEER—Heating and Ventilating, prepare plans, layout of proposed installation, material lists, costs.

HEATING ENGINEER for Sales work. Combination Retail and Wholesale.

SERVICE MAN—Experienced with oil burners, repair and regulation, stokers, thermostats and all heating controls.

Permanent Position—Eastern Indiana. State age, education, experience, salary expected, references, present employment status. Replies held confidential.

Address Key No. 628, American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

WANTED: A First Class Sheet Metal Worker who can cut patterns of all kinds, one experienced in Dust Collecting and Ventilating systems preferred. Also several erecting mechanics experienced in installing Dust Collecting and Ventilating systems. This is an unusual opportunity for strictly temperate thoroughly experienced men, pays highest wages and steady work.
CONNECTICUT BLOWER COMPANY
P. O. Box 884
Hartford, Connecticut

BLOW PIPE MECHANICS WANTED

Experienced men needed for shop work and for out-of-town installation of dust control systems in grain elevators, flour mills, and factories. Permanent and steady employment assured.
WICHITA SHEET METAL WORKS
322 N. Washington Ave.
Wichita 2, Kansas

LINES WANTED

Sales organization operating in Oregon, Washington and Idaho calling on heating, air conditioning, plumbing, hardware and appliance jobbers and trade, is seeking lines for present and postwar development. Particularly interested in warm air furnaces, oil burners, stokers, blowers, tools and specialties. Will act as commission agents, warehouse for your account or handle as distributor. Bank references. Key No. 626, American Artisan, 6 N. Michigan Avenue, Chicago 2, Ill.

IF YOU NEED

- EMPLOYEES
- EQUIPMENT
- LINES
- AGENTS

TRY THE CLASSIFIED AND SERVICE SECTIONS OF AMERICAN ARTISAN

WANTED

A distributor or dealer franchise for Detroit and vicinity by one of the State's largest heating contractors. Send full particulars at once on oil—gas—stokers—gravity and forced air furnaces. We are interested in a complete line, but not necessarily with one company. Address Key No. 627, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

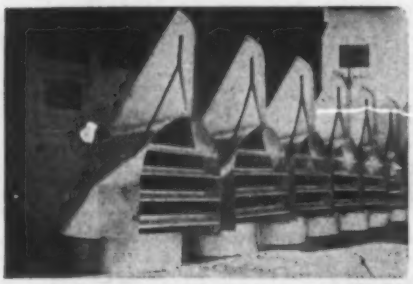
MISCELLANEOUS

SLATER'S RIPPER
Forged Tool Steel Blade
Specially Hardened and Tempered
Specially Hardened to Spring Temper
Also
Sheet Metal Workers
Roofers' and Slaters' Tools
Tongs, Scrapers, Stakes, Hammers
and Made-to-Order Specialties
JOHN STORTZ & SON, INC.
Tool Manufacturers Since 1853
210 Vine St., Philadelphia 6, Pa.

Buy Victory Bonds

AMERICAN ARTISAN Service Section

THOUSANDS



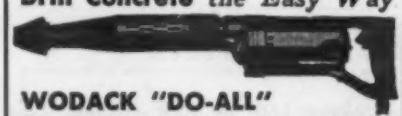
of Accurate Ventilators Shipped Every Month!

. . . and the demand for Accurate Revolving Vents is ever increasing . . . Surely they must be good or such volume could not be maintained. Wise dealers always have a few on hand. See your jobber or write us direct.

Accurate Mfg. Works

2336-38 Milwaukee Avenue Chicago 47, Ill.

Drill Concrete *the Easy Way*



WODACK "DO-ALL" ELECTRIC HAMMER AND DRILL

Saves time and money installing expansion anchors. Drills concrete to 1⅛" dia.; metal to ⅜". Two tools in one. Easy to maintain. Universal motor. Star drills in 17 diameters. Also chisels, bull points, etc. Write for bulletin No. 644.

Wodack Electric Tool Corporation
4627 W. Huron St. Chicago 44, Ill.
Telephone AUstin 9866

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METAL WORKING EQUIPMENT

Lockformers
Chicago Steel Brakes
Black & Decker Electric Tools
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Peck, Stow & Wilcox Equipment
Barth Squaring Shears
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Barth Bar Folders
Barth Combination Machines

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W. F. POTTS, SON & CO., Inc.

1224 Cherry St. Philadelphia 7, Pa.

ALL STYLES **SKYLIGHTS** ALL SIZES

WILLIS SKYLIGHTS are designed to give a maximum of light with perfect ventilation. Constant improvement for over forty years, guarantees WILLIS customers greater value, both in construction and workmanship.

Willis skylights are constructed with condensation gutters on all bars and at the eaves to carry away the moisture. They are water-tight without the use of putty and are easily installed on old or new buildings.

NO. 205

Our engineering department will be glad to assist you in your skylight problems.

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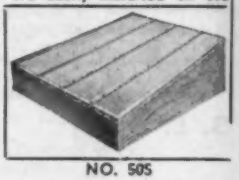

NO. 505

WILLIS STEEL CORPORATION — — Galesburg, Illinois
156 NO. ACADEMY ST.

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2 IRONS IN 1

***TIP* HAS 2 HEATS**

REGULAR HEAT — 150 Watts — is developed by the light weight (18 oz.) Dual-Heat Soldering Iron.

INTENSE HEAT — Dual-Heat irons produce 300 Watts for soldering, tinsmithing and production soldering. By touch of the bottom the intense heat—enough to make the tip red hot—is instantly available. Heating element is molded into a thermal shock-resisting ceramic — no mica insulators are used.

Write for details. See your local dealer. Jobbers and dealers wanted.

DUAL-HEAT IRON CO.
4370 Sunset Boulevard
Hollywood 27, California

Pentco Improved Compound Action Aviation Snips

U. S. Government approved

For Cutting All Kinds of Metals

A Real Precision Tool!
Maximum Power—Minimum Effort
Right and Left Cut

Blades made from alloy steel hardened and tempered for rough use. Will cut with ease all grades of steel. Side locking feature that will not interfere with cutting blades. Case hardened bolts. Made in four different types. Write for catalog S.

PENN TOOL CO.
2415 N. HOWARD ST., PHILADELPHIA, PA.

"CENTRAL-WEST" can furnish your Sheet Metal Machinery Requirements

• Steel Hand Brakes • Press Brakes • 'Rex' Spot Welders
— LOCKFORMERS —
• 'Pexto' Shears, Folders, Rolls, Rotary Machines, Etc.
• Whitney Tools • Electric Shears, Drills • Shop Tools
— Smith Cleat Benders —

Complete Line of Sheet Metal and Ventilating Supplies

FRED E. MILLER — "Always Ready to Serve You" — N. A. LINDVALL

CENTRAL-WEST MACHINERY CO.
Not Inc.
335 S. Western Ave. - Haymarket 8361 - Chicago, Illinois

LUCO

SOLDERING FLUX

in Liquid, Paste and Salts
STAINLESS STEEL FLUX
SALBRICK
Solid Sal-Ammoniac

LUKENS METAL CO.
3011 E. Hedley St. Phila., Pa.
Jobbers Inquiries Invited

GRAND RAPIDS FURNACE CLEANERS

Write for Details

DOYLE VACUUM CLEANER CO.
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Grand Rapids 7, Mich.

SERVICE SECTION: Rates for display space in the Service Section are $5.00 per inch per insertion. One-inch minimum space accepted.

AMERICAN ARTISAN Service Section

THE HINMAN BENDERS

Angle & U, Eye and Pipe

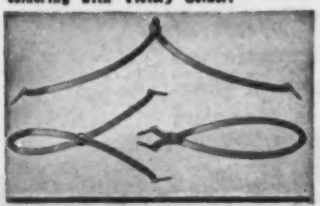
Write for catalog.

manufactured by

J. K. Supply Company, Successors to
L. R. Evans Machine Co.
SANDWICH, ILLINOIS

Will Cut Soldering Costs In Half
No More Changing of Irons

Always the Right Amount of Heat for the lightest as well as the heaviest jobs. Especially adaptable for soldering with Victory Solder.



Quick set dividers—fastest and most accurate on the market—two sizes for circles up to 36" and 48". Guaranteed—Order now.

REINER & CAMPBELL CO., Inc.
867 Norwood Terrace, Elizabeth, N. J.

HELP TO BRING
THE BOYS HOME!
BUY BONDS

LOW PRICED — IMMEDIATE DELIVERY

CRIMPERS & BEADERS: NEW 24-ga. PEXTO IN STOCK—IMMEDIATE DELIVERY.

PIPE FOLDERS 60" Nia. Power; 46" 16 ga. Folder & Brake

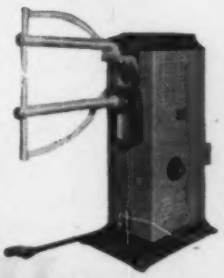
ROLLER LEVELLERS: 5' Niles, 7 rolls, 6¼" dia. M. D. 48" Poole LEVELL, M.D. Black Grd., 17 rolls, 2¾" dia. 48"x10" Globe Hydr. Horizontal SHEET STRETCHER.

ROLLS—CORRUG.: 32" Pexto; 30"x3"; 36"x3"; 31"x4⅜".

SHEARS—ROTARY: NO. 6 QUICKWORK, 1" capacity, 48" throat. POWER GAP: 8' MORGAN, 1" cap., 26" gap. M.D.

WELDERS: 25 KVA THOMSON, 12" thr.; 20 KVA GIBB Press Type, 60/220. 15 KVA WINFIELD; 19 KW FEDERAL.

NEW REX WELDERS IN STOCK—
150, 100, 75, 50, 40, 30, 20, 10, 7½ & 5 KVA.
IMMEDIATE DELIVERY — NO PRIORITY REQUIRED



INTERSTATE *Machinery Co., Inc.*

1433 W. PERSHING RD., CHICAGO 9, ILL.

A TIME SAVER

CHAMPION DRAW ACTION PIPE CRIMPER

Length—14 Inches
Weight—one lb. 10 ozs.

Crimps plain round, square and rectangular pipe—quickly, perfectly and easily. Can be used in the shop or carried conveniently in the tool kit to outside jobs. Appreciated by those who install warm air furnace pipe, wall stacks, air ducts, smoke, conductor and water heater vent pipe, etc. Price $2.50 f. o. b. Factory.

Jobbers and Installers:
Write for full details today

CHAMPION TOOL COMPANY
376 West 41st Place, Los Angeles 37, Calif.

Improved Super Drill Grinder

Sharpens round shank drills from 3-32" to 1 1-16" diameter. GRINDS OLD DRILLS LIKE NEW IN 4 DIFFERENT DRILL POINT ANGLES. GRINDS SHORT, MEDIUM AND LONG TWIST DRILLS FROM 1½" UP TO 11" LONG. FOR HAND OR POWER GRINDING WHEELS.

WORKMEN GRIND THEIR DRILLS LIKE FACTORY IN 25 SECONDS. Gives perfect center and clearance. Saves Drills, time and money. No shop should be without the Super Drill Grinder. Guaranteed to do the work or money back. The grinder that gives a rounded point! Mail check or money order with printed address. Your SUPER DRILL GRINDER will come by return mail, postage paid. Only $2.95.

CRANDALL MFG. CO.

Dept. AAT-1, 1512 W. Slauson, Los Angeles 44, Calif.

SMITH'S CLEAT BENDERS

THE COMPLETE DRIVE CLEATING MACHINE

SAVES MORE TIME per joint of pipe, over ordinary hand methods, than any other machine used on square pipe work . . . and it is USABLE MORE OFTEN per job, because it edges the pipe and makes drive cleats to join them together.

NOW TWO SIZES

NO. 12
Takes All Sizes Up to 12"

NO. 18
Takes All Sizes Up to 18"

Write for More Information.

R. E. SMITH 1513 MONROE, WAUKEGAN, ILL.

TOOLS for the ROOFING CONTRACTOR

ASBESTOS SHINGLE CUTTERS
AXES
BEAMS
BRACKETS
BROOMS
BUCKETS
CALKING GUNS
CALKING CEMENT
DIPPERS
HATCHETS
HOISTS—PORTABLE
HOISTING WHEELS
HOOKS
INSULBRIC CUTTERS
KETTLES
KNIVES
LADDERS
LADDER JACKS
KNOT BRUSHES
MOPS: JEWEL, FREY PATENT, CABLE CORD, SOFT YARN
MOP BELLS
MOP HANDLES
NAILS, CONCRETE
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SCRAPERS
SLATERS' TOOLS
TROWELS
WHEELBARROWS

FRANK P. FREY & CO.

2634 W. MADISON STREET CHICAGO, ILLINOIS

In Stock — Immediate Delivery

Complete Line New and Used Sheet Metal Machinery

MILTON SLIP ROLL FORMING MACHINES

These machines are new and of our own manufacture. 10 ga. and lighter. 3' to 10' long. Compact, heavy duty, conservatively rated. Power or hand operation. Milton geared slitting shears—new—capacity 3/16 iron and lighter. Length of cutting blades 10 in. Dealer representatives wanted.

MILTON EQUIPMENT CO.
402-08 Race St. Philadelphia 6, Pa.

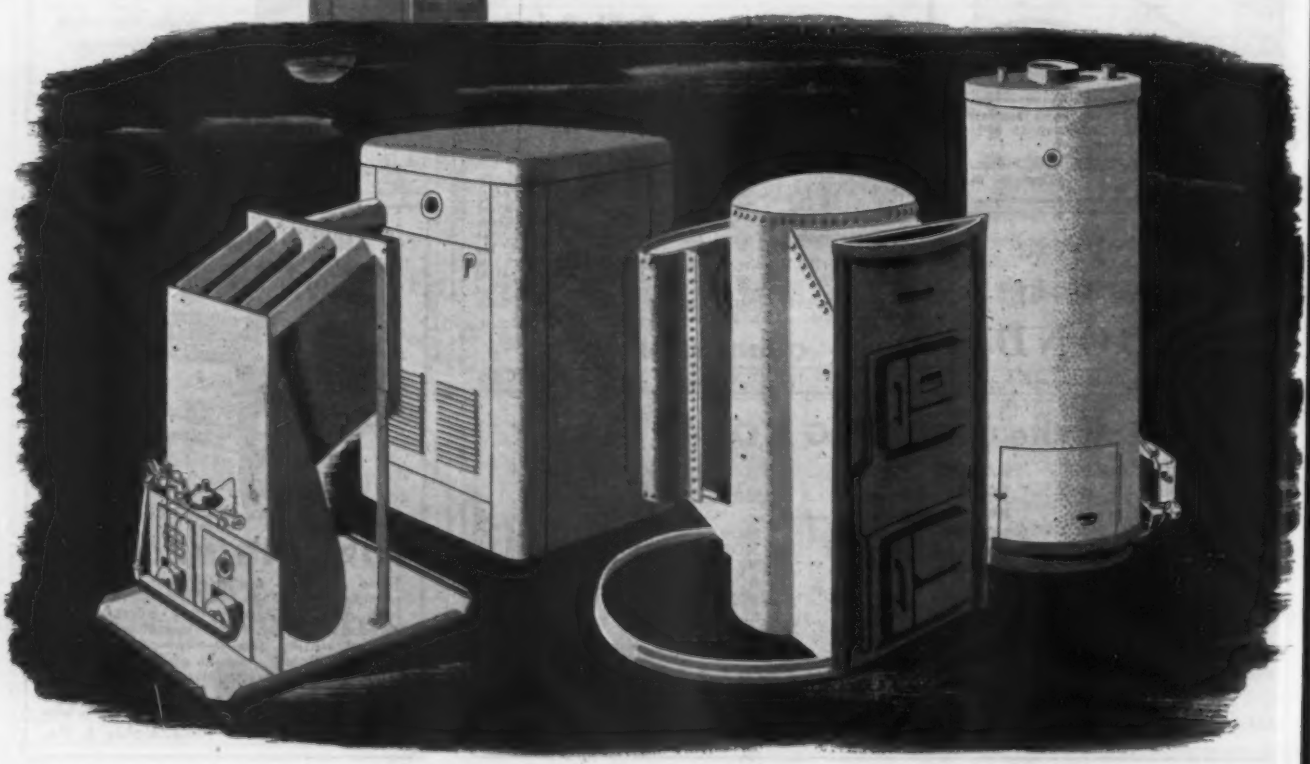
After four years of war production we have been released from war duty. We now have several production lines operating, with products leaving them to be distributed to the furnace dealers of America.

We're Producing Again!

Just as soon as sufficient materials are available to meet Dowagiac Steel Furnace Company's exacting quality standards, our complete line of heating equipment will be on the market.

DOWAGIAC *Steel Furnace Company*

DOWAGIAC MICHIGAN



Section of

JANUARY, 1946

AMERICAN ARTISAN

1946 DIRECTORY

OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

Section 1.—Products Classified . . . . Page 254

If you want to know the names of one or more manufacturers making a certain product, look in Section 1, where products are classified alphabetically in directory style with the noun governing (for instance, Warm Air Furnaces are listed as Furnaces, Warm Air).

Section 2.—Trade Names . . . . . Page 309

If you have the trade name of a product and want to know who manufactures it, look in Section 2, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be readily identified under their product classifications in Section 1.

Section 3.—Manufacturers' Addresses . . Page 329

For the complete name and address of any manufacturer, look in Section 3.

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, page 347-348, for the page on which you will find the advertising of any of these manufacturers.

Section of

American Artisan

1946 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 1—PRODUCTS CLASSIFIED]

● The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers page 347-348, for the page on which you will find the advertising of any of these manufacturers.

ADSORBERS, ODOR

Betz Corp., Hammond, Ind.
Carbide & Carbon Chemicals Corp., New York City.
● Connor Engineering Corp., W. B., New York City.
Refinite Corp., Omaha, Nebr.
Lundy Co., E. A., New York, N. Y.
Wheeler, Inc., W. H., New York City. (Air Freshening Compounds)

AIR CONDITIONING FURNACES

See Furnaces, Warm Air, Air Conditioning

AIR CONDITIONING UNITS, CENTRAL PLANT, SUMMER

(Self-contained fan, filter and cooling coil unit for connection to refrigerating compressor or cold water supply with duct distribution of air)

Air Conditioning & Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
Air & Refrigeration Corporation, New York City.
● Airtemp Division, Chrysler Corp., Dayton, O.
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Beacon-Morris Corporation, Boston.
Buffalo Forge Co., Buffalo.
Carrier Corp., Syracuse, N. Y.
● Clarage Fan Co., Kalamazoo, Mich.
Conditionaire Unit Co., Chicago.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Drayer-Hanson, Inc., Los Angeles.
Fedders Mfg. Co., Inc., Buffalo.
Forman Air Conditioning & Eng. Co., New York City (freon).
Frigidaire Division, General Motors Corp., Dayton, O.
● General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Governair Corp., Oklahoma City, Okla.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Howe Ice Machine Co., Chicago.
Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Lennox Furnace Co., Marshalltown, Ia.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Mario Coil Co., St. Louis.
Micheli Air Conditioning Co., Inc., Schenectady, N. Y.
Niagara Blower Co., New York City.
Peerless of America, Inc., Marion, Ind.
Pernot & Rich, Inc., Los Angeles.
● Premier Furnace Co., Dowagiac, Mich.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
● Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
● Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
● U. S. Air Conditioning Corp., Minneapolis.
Vilter Manufacturing Co., Milwaukee.
● Williams Oil-O-Matic, Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
X L Refrigerating Co., Inc., Chicago.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, CENTRAL PLANT, WINTER, SPLIT SYSTEM TYPE

(Self-contained fan, filter, humidifier and heating coil unit for connection to steam or hot water boiler with duct distribution of air)

Air Conditioning & Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
Air & Refrigeration Corporation, New York City.
● Airtemp Division, Chrysler Corp., Dayton, O.
Aladdin Heating Corp., Oakland, Calif.
Allis-Chalmers Manufacturing Co., Milwaukee.
American Blower Corp., Detroit.
Bahnson Co., Winston-Salem, N. C.
Beacon-Morris Corporation, Boston.
Buffalo Forge Co., Buffalo.
Carrier Corp., Syracuse, N. Y.
● Clarage Fan Co., Kalamazoo, Mich.
Fedders Mfg. Co., Inc., Buffalo.
● Fitzgibbons Boiler Co., Inc., New York City.
● General Electric Co., Bloomfield, N. J.
Handelan Washed Air Co., Minneapolis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.
Johnson Co., S. T., Oakland, Calif., and Philadelphia.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
McQuay, Inc., Minneapolis.
Mario Coil Co., St. Louis.
● Mayflower Air Conditioners, Inc., St. Paul.
Micheli Air Conditioning Co., Inc., Schenectady, N. Y.
New York Blower Co., Chicago.
Niagara Blower Co., New York City.
Peerless of America, Inc., Marion, Ind.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Economics Co., Inc., Canton, O.
Richmond Radiator Co., New York City.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
● Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
● Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
● U. S. Air Conditioning Corp., Minneapolis.
Western Blower Co., Seattle, Wash.
● Williams Oil-O-Matic, Div. Eureka Vacuum Cleaner Co., Bloomington, Ill.
● Wood Industries, Inc., Gar, Detroit.
York Corporation, York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, EVAPORATIVE TYPE, SUMMER

(For cooling with sprays, no dehumidification)

Air & Refrigeration Corp., New York City.
● Alton Manufacturing Co., Dallas, Tex.
American Blower Corporation, Detroit.
American Cooling Tower Co., Kansas City.
American Metal Products, Fort Worth, Tex.
April Showers Co., Washington, D. C. (Roof Spray)
Aqua-Mist Co., Topeka, Kans.
Bahnson Co., Winston-Salem, N. C.
Bien Air Conditioning Company, Bell, Calif.
Beacon-Morris Corporation, Boston.

● Advertisement in this issue. See Index to Advertisers, pages 347-348.

Campbell Heating Co., E. K., Kansas City.
Carrier Corporation, Syracuse, N. Y.
Dallas Engineering Co., Inc., Dallas, Tex.
Drying Systems, Inc., Chicago.
Essick Manufacturing Co., Los Angeles.
Farr Company, Los Angeles.
Goetti Bros., Phoenix, Ariz.
Great National Air Conditioning Corp., Dallas, Tex.
International Sales Co., San Francisco.
Little Giant Vaporizer Co., Oklahoma City.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver, Colo.
National Engineering & Manufacturing Co., Kansas City.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Pernot & Rich, Inc., Los Angeles.
Reynolds Manufacturing Co., Springfield, Mo.
Royal Air Conditioning Equipment Co., Alhambra, Calif.
Schelm Brothers, Inc., East Peoria, Ill.
Shreveport Eng. Co., Inc., Shreveport, La.
Stewart Company, W. H., Oklahoma City, Okla.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Western Blower Co., Seattle, Wash.
X L Refrigerating Co., Inc., Chicago.

AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

(Self-contained blower, coil, filter unit for connection to remote compressor or cold water supply)

American Coils, Inc., Newark, N. J.
• Airtemp Division, Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
• General Electric Co., Bloomfield, N. J.
Giant Mfg. Co., Council Bluffs, Ia.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Mfg. Co., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
King Ventilating Co., Owatonna, Minn.
McQuay, Inc., Minneapolis.
Norwin Co., Freeport, Ill.
Peerless of America, Inc., Marion, Ind.
• Premier Furnace Co., Dowagiac, Mich.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Scott-Newcomb, Inc., St. Louis.
Trane Company, La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
X L Refrigerating Co., Inc., Chicago.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, ROOM TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, UNDER 3 H. P.

(Self-contained blower, coils, compressor and filter unit)

• Airtemp Div., Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
Frigidaire Div., General Motors Sales Corp., Dayton, O.
• General Electric Co., Bloomfield, N. J.
Ice Cooling Appliance Corp., Morrison, Ill. (Ice)
Ilg Electric Ventilating Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Peerless of America, Inc., Marion, Ind.
Philco Radio & Television Corp., Philadelphia.
Pleasantaire Corp., Washington, D. C.
• Premier Furnace Co., Dowagiac, Mich.
Scott-Newcomb, Inc., St. Louis.
• Viking Manufacturing Corporation, Cleveland.
York Corp., York, Pa.

AIR CONDITIONING UNITS, ROOM TYPE, WINTER, FLOOR CABINET

(Self-contained blower, filter, heating coil, humidifier unit)

Air & Refrigeration Corporation, New York City.
Carrier Corp., Syracuse, N. Y.
• Clarage Fan Company, Kalamazoo, Mich.
• Fitzgibbons Boiler Company, Inc., New York City.
• General Electric Co., Bloomfield, N. J.
Ilg Electric Ventilating Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kehm Corporation, Chicago.
Kennard Corporation, St. Louis.
McQuay, Inc., Minneapolis.
Peerless of America, Inc., Marion, Ind.
Refrigeration Economics Co., Inc., Canton, O.
Richmond Radiator Co., New York City.
Somers, Inc., H. J., Detroit.
• Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
• U. S. Air Conditioning Corp., Minneapolis.
• Viking Manufacturnig Corp., Cleveland 14.
York Corp., York, Pa.

AIR CONDITIONING UNITS, ROOM TYPE, YEAR AROUND, FLOOR CABINET

(Self-contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply and steam or hot water)

Air & Refrigeration Corporation, New York City.
• Airtemp Division, Chrysler Corp., Dayton, O.
American Coils, Inc., Newark, N. J.
Beacon-Morris Corp., Boston, Mass.
Carrier Corp., Syracuse, N. Y.
• Clarage Fan Co., Kalamazoo, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Drayer-Hanson, Inc., Los Angeles.
• General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Hastings, Nebr.
Johnson Co., S. T., Oakland, Calif.
Kauffman Air Conditioning Corp., St. Louis.
Kelvinator Div., Nash-Kelvinator Corp., Detroit.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
McQuay, Inc., Minneapolis, Minn.
Mario Coil Co., St. Louis.
Niagara Blower Co., New York City.
Peerless of America, Inc., Marion, Ind.
Pfening Co., Fred D., Columbus, O. (Industrial Bakery)
Refrigeration Economics Co., Inc., Canton, O.
Trane Co., La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
York Corp., York, Pa.

AIR CONDITIONING UNITS, STORE TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COMPRESSOR, 3 H. P. AND OVER

(Self-contained blower, coil, compressor, filter unit, with air discharge approximately 6 ft. above floor)

Air Conditioning & Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
• Airtemp Div., Chrysler Corp., Dayton, O.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Brunner Manufacturing Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
• Clarage Fan Company, Kalamazoo, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Forman Air Conditioning & Eng. Co., New York City (Freon)
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
• General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Governair Corporation, Oklahoma City, Okla.
Kauffman Air Conditioning Corp., St. Louis.
Kramer Trenton Co., Trenton, N. J.
Nevinger Manufacturing Co., Inc., Greenville, Ill.
Peerless of America, Inc., Marion, Ind.
Refrigeration Appliances, Inc., Chicago.
Scott-Newcomb, Inc., St. Louis, Mo.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trane Company, LaCrosse, Wis.
• Viking Manufacturing Corp., Cleveland.
X L Refrigerating Co., Inc., Chicago.
York Corp., York, Pa.

AIR DIFFUSERS

See Diffusers, Air

AIR FILTERS

See Filters, Air

AIR METERS

See Meters, Air Velocity, Direct Reading

AIR WASHERS

See Washers, Air

ANALYZERS, CO_2, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago.
Defender Instrument and Regulator Co., St. Louis.
Dwyer Mfg. Co., F. W., Chicago.
Eimer & Amend, New York City.
Ellison Draft Gage Co., Chicago.
Engelhard, Inc., Chas., Newark, N. J.
General Scientific Equipment Co., Philadelphia.
Hays Corp., Michigan City, Ind.
Huyette Co., Inc., Paul B., Philadelphia.
Permutit Co., New York City.
Precision Control Co., San Francisco.
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Service to Industry, West Hartford, Conn.

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Uehling Instrument Co., Paterson, N. J.
Weaver Mfg. Co., Springfield, Ill.

ANEMOMETERS

American Instrument Co., Silver Spring, Md.
Barclay, Inc., Robert, Chicago.
Detroit Air Conditioning Service Co., Inc., Detroit.
Friez Instrument Div., Towson, Md.
Hill, E. Vernon, Chicago.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.
Wilson Products, Inc., Reading, Pa. (Thermometer)

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Alpha Metals, Inc., Brooklyn, N. Y.
Aluminum Co. of America, Pittsburgh.
• American Brass Co., Waterbury, Conn.
American Sheet Metal Works, New Orleans, La.
Atlantic Steel Co., Atlanta, Ga.
• Bethlehem Steel Co., Bethlehem, Pa.
Brasco Manufacturing Co., Harvey, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron structural shapes).
• Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
• Columbia Steel Co., San Francisco.
Dahlstrom Metallic Door Co., Jamestown, N. Y. (Angles, Channels)
Davis & Siehl Co., Cincinnati.
Decatur Iron & Steel Co., Decatur, Ala.
Dow Chemical Co., Midland, Mich.
Downs-Smith Brass & Copper Co., Inc., New York City.
Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh.
Laclede Steel Co., St. Louis.
Lees Div., John, Serrick Corp., Muncie, Ind.
Mesker & Co., Geo. L., Evansville, Ind.
• Milcor Steel Co., Milwaukee.
• Republic Steel Corp., Cleveland.
• Revere Copper & Brass, Inc., New York City.
Sioux Steel Co., Sioux Falls, S. D.
Steel & Tubes, Inc., Cleveland.
Technical Processes Div., Colonial Alloys Co., Philadelphia.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Truscon Steel Co., Youngstown, O.
• Weirton Steel Co., Weirton, W. Va.
Werner Co., Inc., R. D., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

ARC WELDERS

See Welders, Arc

ARC WELDING ELECTRODES

See Electrodes, Arc Welding

ASBESTOS BOARD

See Board, Duct, Asbestos

ASBESTOS PAPER

See Paper, Asbestos

ATTIC FANS

See Fans, Night Air Cooling

ATTIC FURNACES

See Furnaces, Warm Air, Air Conditioning for Attic Installation

AUTOMATIC HUMIDIFIERS

See Humidifiers, Furnace, Evaporation, Spray

BAFFLES, OIL BURNER & STOKER

• Air Devices, Inc., New York City.
Barclay, Inc., Robert, Chicago.
Commonwealth Products Co., Philadelphia.
Harvey, Inc., Sid, Valley Stream, N. Y.
Jones Products Co., Ferndale, Mich.
Laclede-Christy Clay Products Co., St. Louis.
McLeod & Henry Co., Inc., Troy, N. Y.
Munn & Steele, Inc., Newark, N. J. (Stoker)
Peterson Co., B. A., Dowagiac, Mich.
Quigley Co., Inc., New York City.

BALANCING EQUIPMENT FOR FANS

Bear Mfg. Co., Rock Island, Ill.
Gisholt Machine Co., Madison, Wis.

BALL BEARINGS

See Bearings, Ball

BAND SAWS

See Saws, Band, Sheet Metal Cutting

BAR FOLDERS

See Machines, Bar Folders

BARS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

BASES AND PADS, VIBRATION ISOLATING

Armstrong Cork Co., Lancaster, Pa. (Cork)
Buffalo Forge Co., Buffalo.
• Clarage Fan Company, Kalamazoo, Mich.
Cork Import Corp., New York City (Cork).
Cork Insulation Co., Inc., New York City.
Ehret Magnesia Manufacturing Co., Valley Forge, Pa.
Felters Co., Boston.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co. Sales Div., Inc., Denver, Colo.
Goodrich Co., B. F., Akron, Ohio.
Johns-Manville, New York City.
Keldur Corporation, New York City.
Korfund Co., Inc., Long Island City, N. Y.
Lord Mfg. Co., Erie, Pa.
M B Manufacturing Co., Inc., New Haven, Conn.
Mundet Cork Corp., Brooklyn, N. Y.
National Lead Co., New York City.
Remco Products Corp., York, Pa.
Robinson Aviation, Inc., Teterboro, N. J.
Sponge Rubber Products Co., Shelton, Conn.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York City.
Vibration Eliminator Co., Long Island City, N. Y. (Cork and Rubber)
Vibration Control Co., New York City.
Western Felt Works, Chicago (Felt)

BATHS, TINNING

American Gas Furnace Co., Elizabeth, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farrelloy Co., Inc., Philadelphia.
Retinning Manufacturing Co., Chicago.

BEADERS

See Machines, Beading

BEAMS

See Angles, Bars, Beams, Channels and Tees (Light weight shapes)

BEARINGS, BALL

Ahlberg Bearing Co., Chicago.
Bantam Bearings Div., Torrington Co., South Bend, Ind.
Bearing Co. of America, Lancaster, Pa.
Burgess-Norton Mfg. Co., Geneva, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., New Britain, Conn.
Landis & Gyr., Inc., New York. (Miniature)
Link-Belt Co., Chicago.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Schatz Mfg. Co., Poughkeepsie, N. Y.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago.
• Air Controls, Inc., Cleveland.
Caldwell Co., W. E., Louisville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago.
Chain Belt Co., Milwaukee.
Chicago Die Casting Co., Chicago.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., New Britain, Conn.
Freed Products Co., Moline, Ill.
General Motors Corp., Moraine Products Div., Dayton, O.
Goldens' Fdry. & Machine Co., Columbus, Ga.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jones Foundry & Machine Co., W. A., Chicago.
• Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago.
Medart Co., St. Louis.
Norma-Hoffmann Bearing Corp., Stamford, Conn.
• Randall Graphite Products Corp., Chicago.
Royersford Foundry & Machine Co., Royersford, Pa.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.
Sprout-Waldron & Co., Muncy, Pa.
Standard Pressed Steel Co., Jenkintown, Pa.
Stephens-Adamson Mfg. Co., Aurora, Ill.
• Triangle Manufacturing Co., Oshkosh, Wis.
• Viking Air Conditioning Corp., Cleveland.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Bantam Bearings Div., Torrington Co., South Bend, Ind.
Dodge Mfg. Corp., Mishawaka, Ind.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Link-Belt Co., Chicago.
Medart Co., St. Louis.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, Trenton, N. J.
Royersford Foundry & Machine Co., Royersford, Pa.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.

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Timken Roller Bearing Co., Canton, O.
Torrington Co., Torrington, Conn. (Needle)
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, SLEEVE

Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Corp., Detroit.
General Motors Corp., Moraine Products Div., Dayton, O.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Medart Co., St. Louis.
Motex Metal Process Corporation, Detroit.
• Randall Graphite Products Co., Chicago.
Wood's Sons Co., T. B., Chambersburg, Pa.

BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Baldwin Belting, Inc., New York City.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Belting Co., Chicago.
Continental Rubber Works, Erie, Pa.
Dayton Rubber Mfg. Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Manufacturing Corp., Mishawaka, Ind.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co., Denver, Colo.
Gilmer Co., L. H., Philadelphia, Pa.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Inc., Akron, O.
Graton & Knight, Worcester, Mass. (Leather)
Jones Foundry & Machine Co., W. A., Chicago.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.
Manheim Mfg. & Belting Co., Manheim, Pa. (Adjustable)
Medart Co., St. Louis.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rockwood Manufacturing Co., Indianapolis.
Schieron Co., Chas. A., New York City.
Thermoid Rubber Div. of Thermoid Co., Trenton, N. J.
United States Rubber Co., New York City.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

BENDERS, ANGLE, ETC.

Bath Company, Cyril, Cleveland.
Champion Blower & Forge Co., Lancaster, Pa.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Hendley & Whittemore Co., Beloit, Wis.
• Hossfield Mfg. Co., Winona, Minn.
• J K Supply Co., Sandwich, Ill.
• Kane & Roach, Inc., Syracuse, N. Y.
Kling Bros. Engineering Works, Chicago.
Martens & Stormoen, Boston 10.
O'Neil-Irwin Mfg. Co., Minneapolis.
Pedrick Tool & Machine Co., Philadelphia.
Thomas Machine Manufacturing Co., Pittsburgh.
• Whitney Metal Tool Co., Rockford, Ill.

BI-METALS, THERMOSTATIC

Chace Co., W. M., Detroit, Mich.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Wilson Co., The, H. A., Newark, N. J.

BLADES, PROPELLER FAN

Ackermann Manufacturing Co., Wheeling, W. Va.
Aerovent Fan Co., Piqua, O.
• Air Controls, Inc., Cleveland.
Aire-Foile Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
• Burden Co., Los Angeles.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Products, Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
Dallas Engineering Co., Inc., Dallas, Tex.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dual-Air Fan Corp., Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago.
Goetti Bros., Phoenix, Ariz.
International Engineering, Inc., Dayton, O.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Martin Fan & Blower Co., Chicago.
Meier Electric & Machine Co., Indianapolis, Ind.
Myers Electric Co., Pittsburgh.
Norwin Co., Freeport, Ill.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Roto-Beam Div., Peerless of America, Chicago.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., Torrington, Conn.
Utility Appliance Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.

BLAST GATES

Allington & Curtis Mfg. Co., Saginaw, Mich.
• Berger Bros. Co., Philadelphia.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
• Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis.
Goethel Sheet Metal Works, Alfred, Milwaukee.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids Mich.
Kirk & Blum Mfg. Co., Cincinnati.
Maysteel Products, Inc., Milwaukee.
• National Metal Fabricators, Chicago.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
R-S Products Corp., Philadelphia.
Spencer Turbine Co., Hartford, Conn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee.

BLOWER—FILTER UNITS

(Separate Conversion Units for Warm Air Furnaces)

Agricola Furnace Co., Inc., Gadsden, Ala.
Air Conditioning Equipment Co., Minneapolis.
• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., Cleveland.
Airwasher Corporation, Lansing, Mich.
Aladdin Heating Corporation, Oakland, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
American Machine Products Co., Marshalltown, Ia.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Ames Co., W. R., San Francisco.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Barrett Engineers, Cleveland Heights, O.
Bishop & Babcock Mfg. Co., Cleveland.
Bovee Furnace Works, Waterloo, Ia.
• Brundage Co., Kalamazoo, Mich.
Bryant Corp., C. L., Cleveland.
Campbell Heating Co., Des Moines, Ia.
• Char-Gale Mfg. Co., Minneapolis.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
• Conco Engineering Works, Mendota, Ill.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Furbio Co., Hermansville, Mich.
Gehri Co., Tacoma, Wash.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis.
• Harvey-Whipple, Inc., Springfield, Mass.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Henry Furnace Co., Medina, Ohio.
• Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater, Mich.
International Sales Co., San Francisco.
• Jackson & Church Co., Saginaw, Mich.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Kelsey Heating Co., Syracuse, N. Y.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
Martin Fan & Blower Co., Chicago.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
Naco Manufacturing Co., Huntington Park, Calif.
New-Aire Blower Co., Dearborn, Mich.
Northwest Foundry & Furnace Works, Inc., Portland, Ore.
• Olsen Mfg. Co., C. A., Elyria, O.
• Palmer Manufacturing Corp., Phoenix, Ariz.
• Payne Furnace Co., Beverly Hills, Calif.
Peerless Electric Co., Warren, O.
• Peerless Foundry Co., Indianapolis.
Pennsylvania Furnace & Iron Co., Warren, Pa.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
Ryniker Steel Products Co., Billings, Mont.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
• Schwab Furnace Co., Milwaukee.
Security Manufacturing Co., Kansas City, Mo.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

• Viking Air Conditioning Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Wayne Automatic Relay Co., Fort Wayne, Ind.
Western Blower Co., Seattle, Wash.
• Williamson Heater Co., Cincinnati.

BLOWER HOUSINGS

See Housings, Blower

BLOWER-WASHER UNITS, FOR CLEANING OR HUMIDIFYING

(Separate Conversion Units for Warm Air Furnaces)

Air Stream Filter Corp., St. Louis.
Airwasher Corporation, Lansing, Mich.
American Blower Corporation, Detroit.
American Machine Products Co., Marshalltown, Ia.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Bishop & Babcock Mfg. Co., Cleveland.
• Brauer Supply Co., A. G., St. Louis.
• Furbio Company, Hermansville, Mich.
• Hess Warming & Ventilating Co., Chicago.
International Sales Co., San Francisco.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
National Engineering & Manufacturing Co., Kansas City.
New York Blower Co., Chicago.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.

BLOWER WHEELS

See Wheels, Blower

BLOWERS, FORCED DRAFT, FOR ASH PIT

American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
Barrett Engineers, Cleveland Heights, O.
Buffalo Forge Co., Buffalo.
Burnwell Corp., Allentown, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
• Champion Products Co., Muskegon, Mich.
• Clarage Fan Co., Kalamazoo, Mich.
Fuel Savers, Inc., Harrisburg, Pa.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
Lehigh Fan & Blower Co., Allentown, Pa.
Martin Fan & Blower Co., Chicago.
Mohler Co., J. K., Ephrata, Pa.
New York Blower Co., Chicago.
• Power Engineering Co., Chicago.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Universal Blower Co., Birmingham, Mich.
Wing Mfg. Co., L. J., New York City.

BLOWERS, FORCED DRAFT, FOR SMOKE PIPE

American Foundry & Furnace Co., Bloomington, Ill.
Barrett Engineers, Cleveland Heights, O.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
Muncie Gear Works, Muncie, Ind.
New York Blower Co., Chicago.

BLOWERS, FURNACE CENTRIFUGAL

Agricola Furnace Co., Inc., Gadsden, Ala.
Air Conditioning Equipment Co., Minneapolis.
• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., Cleveland.
Airecon Industries, Incorporated, Detroit.
Aladdin Heating Corporation, Oakland, Calif.
American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis, Mo.
American Machine Products Co., Marshalltown, Ia.
Ames Co., W. R., San Francisco.
Auburn Burner Co., Auburn, Ind.
Barrett Engineers, Cleveland Heights, O.
Bishop & Babcock Mfg. Co., Cleveland.
• Brundage Co., Kalamazoo, Mich.
Buffalo Forge Co., Buffalo.
Campbell Heating Co., Des Moines, Ia.
Champion Blower & Forge Co., Lancaster, Pa.
Chandler Co., Cedar Rapids, Ia.
• Clarage Fan Co., Kalamazoo, Mich.
Freed Products Co., Moline, Ill.
• Furbio Co., Hermansville, Mich.
Gehri Co., Tacoma, Wash.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
Goetti Bros., Phoenix, Ariz.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Hess Warming & Ventilating Co., Chicago.
International Sales Co., San Francisco.
Jaden Mfg. Co., Hastings, Nebr.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Iowa.
• Majestic Co., Huntington, Ind.
Martin Fan & Blower Co., Chicago.
Mauer Engineering, Evanston, Ill.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Morrison Products, Inc., Cleveland.
Mountain States Equipment Company, Denver, Colo.
• Mueller Furnace Co., L. J., Milwaukee.
Naco Manufacturing Co., Huntington Park, Calif.
New-Aire Blower Co., Dearborn, Mich.
New York Blower Co., Chicago.
Northern Furnace & Supply Company, Billings, Mont.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Peerless Electric Co., Warren, O.
• Premier Furnace Co., Dowagiac, Mich.
Reynolds Mfg. Co., Grand Rapids, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
Ryniker Steel Products Company, Billings, Mont.
Schelm Brothers, Inc., East Peoria, Ill.
• Schwitzer-Cummins Co., Indianapolis.
Security Manufacturing Co., Kansas City, Mo.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
• Skuttle Manufacturing Co., Detroit.
Smith Manufacturing Co., Inc., F. A., Rochester, N. Y.
Standard Heating Equipment Co., Waterloo, Ia.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trade-Wind Motorfans, Inc., Los Angeles.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Western Blower Co., Seattle, Wash.

BLOWERS, INSULATION

Allen Billmyre Co., Mamaroneck, N. Y.
General Blower Co., Morton Grove, Ill.
Insulating Equipment Co., Chicago.
Pottstown Blower Co., Mamaroneck, N. Y.
Rotary Compressor Blower Co., Grove City, Pa.
Spencer Turbine Co., Hartford, Conn. (Blower only)
Superior Mfg. Co., Alexandria, Ind.

BLOWERS, VENTILATING SYSTEM

(Capacity 4,000 c.f.m. up)

Advance Fan & Blower Co., Detroit.
• Air Controls, Inc., Cleveland.
Aladdin Heating Corporation, Oakland, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Company, Marshalltown, Ia.
Ames Co., W. R., San Francisco.
Ballantyne Co., Omaha, Nebr.
• Bayley Blower Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
• Brundage Co., Kalamazoo, Mich.
Buffalo Forge Co., Buffalo.
Campbell Heating Company, Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Champion Blower & Forge Co., Lancaster, Pa.
• Clarage Fan Co., Kalamazoo, Mich.
Coppus Engineering Corp., Worcester, Mass.
De Bothezat Fans Division, American Machine & Metals, Inc. East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago.
• Furbio Co., Hermansville, Mich.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Hastings Air Conditioning Company, Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
International Sales Co., San Francisco.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Johnson Fan & Blower Corp., Chicago.
King Ventilating Co., Owatonna, Minn.
Kortz Blower Mfg. Co., Grand Rapids, Mich.
La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio.
• Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Martin Fan & Blower Co., Chicago.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver, Colo.
Naco Manufacturing Co., Huntington Park, Calif.
National Engineering & Manufacturing Co., Kansas City.
• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Niagara Blower Co., New York City.
Northern Blower Co., Cleveland.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Peerless Electric Co., Warren, O.

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Phelps Mfg. Co., Little Rock, Ark.
• Power Engineering Co., Chicago.
Reynolds Manufacturing Co., Grand Rapids, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Schwitzer-Cummins Co., Indianapolis.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., St. Louis.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trane Company, LaCrosse, Wis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.
Wing Mfg. Co., L. J., New York City.

BLOW PIPE EQUIPMENT

See Blast Gates; Collectors, Blow Pipe; Fittings, Blow Pipe

BOARD, SUBSTITUTE MATERIAL, FOR DUCTS

Carey Mfg. Co., Phillip, Lockland, Cincinnati, Ohio.
Celotex Corporation, Chicago.
Johns-Manville, New York City.
Keasbey & Mattison Company, Ambler, Pa.
Keystone Asphalt Products Co., Chicago.
Masonite Corporation, Chicago.
Ruberoid Co., New York City.
• Sall Mountain Co., Chicago.
United States Gypsum Company, Chicago.
• Wilson, Inc., Grant, Chicago.

BOLTS, EXPANSION

Chase Brass & Copper Co. Incorporated, Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., New York City.
Industrial Screw Co., Chicago.
National Lead Co., New York City.
Paine Company, The, Chicago.
Phillips Drill Co., Chicago. (Shells)
Rawlplug Company, Inc., New York City.
Rolyan Metal Products, Chicago.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOLTS, TOGGLE AND ANCHOR

Carpenter & Paterson, Inc., East Boston, Mass.
Carty & Moore Engineering Co., Detroit (Anchor).
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago.
Crawford Co., Chicago.
Davis & Siehl Co., Cincinnati.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Downs-Smith Brass & Copper Co., Inc., New York City.
Fee & Mason Mfg. Co., Inc., New York City.
Grabler Mfg. Co., Cleveland.
Industrial Screw Co., Chicago.
Paine Company, The, Chicago.
Rawlplug Company, Inc., New York City.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOOSTER FANS

See Fans, Booster

BOOTS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

BRAKES, METAL WORKERS', HAND

• Dreis & Krump Mfg. Co., Chicago.
Eiker Mfg. Co., Ogallala, Nebr.
Excelsior Tool and Machine Co., East St. Louis, Ill.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
O'Neill-Irwin Mfg. Co., Minneapolis.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York City.
• Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', PORTABLE

• Dreis & Krump Mfg. Co., Chicago.
Eiker Mfg. Co., Ogallala, Nebr.
Harris, A. R., Hammond, Ind.
O'Neil-Irwin Mfg. Co., Minneapolis.
• Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', POWER

Bath Company, Cyril, Cleveland.
Cincinnati Shaper Co., Cincinnati.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.
• Dreis & Krump Mfg. Co., Chicago.
Heartley Machine & Tool Co., Toledo, O.
Ohl & Co., Geo. A., Newark, N. J.
• Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
• Verson Allsteel Press Co., Chicago.
Weiss & Co., H., New York City.
• Whitney Metal Tool Co., Rockford, Ill.

BRUSHES, ACID

Eastern States Supply Co., Brooklyn, N. Y.
• Lukens Metal Co., Thos. F., Philadelphia.
Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
Potomac Mfg. Co., Philadelphia.
• Schaefer Brush Mfg. Co., Milwaukee (Rustproof).
Weiss & Co., H., New York City.

BRUSHES, FURNACE

Mill-Rose Co., Cleveland.
Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
Pilley Brush Co., Fort Madison, Iowa.
• Schaefer Brush Mfg. Co., Milwaukee.
Worcester Brush & Scraper Co., Worcester, Mass.

BUFFERS, GRINDERS, POLISHERS AND SANDERS, ELECTRIC

Albertson & Co., Inc., Sioux City, Iowa.
Baldor Electric Co., St. Louis. (Buffers, grinders)
• Black & Decker Mfg. Co., Towson, Md.
Brown-Brockmeyer Co., Inc., Dayton, O.
Buckeye Tools Corp., Dayton, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Pneumatic Tool Co., New York City.
Cincinnati Electric Tool Co., Cincinnati (with dust collector).
Clark Jr. Electric Co., Jas., Louisville, Ky.
Cleveland Pneumatic Tool Co., Cleveland. (Pneumatic)
Detroit Surfacing Machine Co., Detroit.
Diehl Mfg. Co., Somerville, N. J.
DoAll Company, Minneapolis.
Hammond Machinery Builders, Kalamazoo, Mich.
Haskins Co., R. G., Chicago.
Hobart Brothers Company, Troy, O.
Ideal Commutator Dresser Co., Sycamore, Ill. (Pneumatic)
• Independent Pneumatic Tool Co., Chicago.
Jefferson Machine Tool Co., Cincinnati.
Keller Tool Company, Grand Haven, Mich. (Pneumatic)
Lee Co., K. O., Aberdeen, S. D.
Mall Tool Co., Chicago.
Millers Falls Co., Greenfield, Mass.
Minnesota Mining & Manufacturing Co., St. Paul, Minn.
Misener Mfg. Co., Inc., Syracuse, N. Y.
Reynolds Electric Company, Chicago.
• Skilsaw, Inc., Chicago.
Snap-On Tools Corp., Kenosha, Wis.
• Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Stow Manufacturing Co., Binghamton, N. Y. (Flexible shaft)
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
U. S. Electrical Motors, Inc., Los Angeles. (Buffers)
Van Dorn Electric Tool Co., Towson, Md.
York Electric and Machine Company, York, Pa.

BURNERS, GAS, CONVERSION, RESIDENTIAL

American Radiator & Standard Sanitary Corp., Pittsburgh.
Anchor Burner Co., Oklahoma City, Okla.
Auburn Burner Co., Auburn, Ind.
Autogas Company, Chicago.
• Barber Gas Burner Co., Cleveland.
Bard Manufacturing Company, Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Bryant Corp., C. L., Cleveland.
Bryant Heater Co., Cleveland.
Burdett Mfg. Co., Chicago.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Columbia Burner Co., Toledo.
Dalzen Tool & Manufacturing Co., Detroit.
Denver Fire Clay Co., Denver, Colo.
Franklin Gas Heating Co., Cincinnati.
Handley Brown Heater Co., Jackson, Mich.
Hansen Electric Co., San Francisco.
Inferno Co., Shreveport, La.
Jackson Sheet Metal Works, Ogden, Utah.
• Johnson Gas Appliance Co., Cedar Rapids, Iowa.
Johnson Co., S. T., Oakland, Calif.
Kals Sunrise Works, Detroit.
Killam Gas Burner Co., Denver, Colo.
Leahy Mfg. Co., Los Angeles.
Martin, J. O. & C. U., San Francisco.
Mettler Co., Lee B., Los Angeles.
Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
National Gas Burner Div., Mid-Continent Metal Products Co., Chicago.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Ransome Co., Emeryville, Calif.
Roberts-Gordon Appliance Corp., Buffalo.
Rotary Mfg. Co., Los Angeles.
Security Manufacturing Co., Kansas City, Mo.
Sonner Burner Co., Winfield, Kans.
Standard Heating & Radiator Co., Pittsburgh.
• Surface Combustion, Toledo, O.

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Vacuum Gas Burner Corp., Olean, N. Y.
Webster Engineering Co., Tulsa, Okla.
• Zinc Co., John, Tulsa, Okla.

BURNERS, OIL, CONVERSION, RESIDENTIAL

Acme Oil Burner Company, Inc., Cedar Rapids, Ia. (Gun).
• Airtemp Division, Chrysler Corp., Dayton, O.
Aldrich Co., Wyoming, Ill.
American Radiator & Standard Sanitary Corp., Pittsburgh. (Gun).
• Anchor Post Fence Co., Heating Div., Baltimore (Gun & Rotary).
Arcweld Mfg. Co., Inc., Seattle, Wash.
Auburn Burner Co., Auburn, Ind. (Gun)
Auto-Heat Corp., New York City (Gun).
Automatic Burner Corp., Chicago. (Gun)
Avery Farm Machinery Co., Hart Oil Burner Dept., Peoria, Ill. (Gun)
Badger Mfg. Co., Madison, Wis. (Gun).
Bard Manufacturing Company, Bryan, Ohio.
Beckett Engineering Co., R. W., Elyria, Ohio (Gun).
Bethlehem Foundry & Machine Co., Bethlehem, Pa. (Gun).
Bovee Furnace Works, Waterloo, Ia. (Gun).
Brigham Oil Burner Co., St. Louis (Gravity).
Bryan Steam Corp., Peru, Ind. (Rotary and gun).
Caloroil Burner Corp., Hartford, Conn. (Atmospheric, gun, horizontal rotary, vacuum pressure, wall flame).
Campbell Machine Co., Minneapolis.
Cary Mfg. Co., Waupaca, Wis. (Gravity).
• Century Engineering Corp., Cedar Rapids, Ia. (Gun).
Chalmers Oil Burner Co., Minneapolis (Gun and rotary).
Chandler Company, Cedar Rapids, Iowa (Gun and gravity).
Chicago Steel Furnace Co., Chicago.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
• Conco Engineering Works, Mendota, Ill. (Gun)
Crane Company, Chicago (Gun).
Dalmo-Victor Co., San Carlos, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y. (Gun).
D'Elia Oil Burner Co., Inc., Bridgeport, Conn. (Gun).
• Dowagiac Steel Furnace Co., Dowagiac, Mich. (Gun)
Eastern Oil & Equipment Co., Portland, Me. (Gun).
Electrol Mfg. Co., Passaic, N. J. (Gun).
Fairfield Oil Heating Co., Inc., Greenwich, Conn. (Gun).
Fargo Foundry Co., Fargo, N. D. (Gun).
Florence Stove Co., Gardner, Mass. (Gravity).
• General Electric Co., Bloomfield, N. J. (Gun)
General Oil Heating Corp., West New York, N. J. (Gun).
Gilbert & Barker Mfg. Co., West Springfield, Mass. (Gun).
Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y. (Gun).
Green Colonial Furnace Company, Des Moines, Iowa (Gun).
• Hall-Neal Furnace Co., Indianapolis. (Gun).
Hardinge Oil Burner & Mfg. Co., Chicago (Gun and rotary).
• Harvey-Whipple, Inc., Springfield, Mass. (Gun)
Heat-Seal Burner Co., Omaha, Nebr. (Gun)
• Heil Co., Milwaukee (Gun).
Herco Oil Burner Corp., Lancaster, Pa. (Gun).
• Hess Warming & Ventilating Co., Chicago.
Hipoint Corp., Bellefontaine, O.
Holtum Mfg. Co., Freeport, Ill. (Gun).
Homer Furnace & Foundry Corp., Coldwater, Mich. (Gun)
Hotentot Co., Inc., Omaha, Nebr. (Gun).
Hubbard Co., Minneapolis (Gun).
Hueller Mfg. Co., Inc., H. J., Brooklyn (Gun).
Iowa Foundry Co., Sioux City, Ia.
Iron Fireman Mfg. Co., Cleveland. (Gun and luminous vortex)
• Jackson & Church Co., Saginaw, Mich.
• Jennings, Freeland L., Lima, O. (With integral domestic water heating unit)
Johnson Co., S. T., Oakland, Calif., and Philadelphia (Gun).
Kals Sunrise Works, Detroit (Gravity, Rotary, Gun).
Kaybar Burner Corp., Chicago.
Keith Furnace Co., Des Moines, Ia. (Gun).
Kleen Heet, Inc., Chicago. (Gun)
Korth Oil Burner Corp., Roselle Park, N. J. (Gun)
• Kresky Mfg. Co., Petaluma, Calif. (Gravity).
Laco Oil Burner Co., Griswold, Ia. (Gun and Gravity).
Leahy Mfg. Co., Los Angeles.
Leeson Air Conditioning Corporation, Detroit (Gun).
Lennox Furnace Co., Marshalltown, Iowa (Gun—Pressure Atomizing).
Little Burner Co., Inc., H. C., San Rafael, Calif. (Gravity).
• Majestic Co., Huntington, Ind. (Gun).
Malleable Iron Fittings Co., Branford, Conn. (Gun).
May Oil Burner Div., Gerotor May Corp., Baltimore. (Gun)
Mayflower Oil Burner Corp., West New York, N. J. (Gun).
McIlvaine Products, Inc., Philadelphia (continuous variable flame).
• Meyer Furnace Co., Peoria, Ill. (Gun).
Miller Co., Meridian, Conn.
Montag Stove & Furnace Works, Portland, Ore. (Gun).
• Mueller Furnace Co., L. J., Milwaukee (Gun, Gravity).
National Airoil Burner Co., Philadelphia (Gun).
• Nu-Way Corp., Rock Island, Ill. (Gun)
Oil Devices, Chicago (Pot Type).
Pan-American Engineering Company, Berkeley, Calif. (Gun, rotary and turbine).
Paragon Oil Burner Corp., Brooklyn.
Peerless Oil Burner Co., Inc., Kansas City, Mo. (Gravity).
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (Gun)
• Petroleum Heat & Power Co., Stamford, Conn. (Gun)
Preferred Utilities Manufacturing Corp., New York City.
Quaker Mfg. Co., Chicago (Vaporizing Bowl).
Quick Furnace & Supply Co., Des Moines, Ia.
Quiet-Heet Mfg. Corp., Newark, N. J. (Gun).
• Quincy Stove Mfg. Co., Quincy, Ill. (Gravity).
Ray Oil Burner Co., San Francisco (Gun, gravity and rotary).
Reif-Rexoll, Inc., Buffalo.
Rotary Mfg. Co., Los Angeles (Rotary).
Round Oak Co., Dowagiac, Mich. (Gun)
• Rudy Furnace Co., Dowagiac, Mich. (Gun).
• Rybolt Heater Company, Ashland, Ohio (Gun).
Sanmyer Corporation, Chicago (Gun).
Sandberg Co., H. J., Portland, Ore.
Scott-Newcomb, Inc., St. Louis (Gun).
Sentry Mfg. Co., Omaha, Nebr. (Gun).
Shedlov Oil Burners, Inc., Minneapolis. (Gun)
Silent Glow Oil Burner Corp., Hartford, Conn. (Gun and rotary).
Simplex Oil Heating Corp., New York. (Gun, rotary, turbine)
Sundstrand Engineering Co., Rockford, Ill. (Gun).
Syncro-Flame Burner Corp., Brockton, Mass. (Gun, rotary).
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit (Gun and rotary).
Todd Shipyards Corporation (Comb. Eq. Div), New York City.
United States Burner Corp., Wethersfield, Conn. (Gun).
Universal Manufacturers, Inc., Midland Park, N. J.
Valley Mfg. Co., Athol, Mass. (Gun and rotary).
Victor Oil Burner Mfg. Co., Hartford, Conn. (Gravity).
• Viking Manufacturing Co., Cleveland. (Gun, vaporizing)
Volcano Burner Corp., New York City (Gun).
• Waterman-Waterbury Co., Minneapolis (Gun).
Wayne Oil Burner Co., Fort Wayne, Ind. (Gun and gravity)
Weatherall Engineers, Inc., Providence, R. I. (Gun).
Westwick & Son, Inc., John, Galena, Ill. (Gun).
• Williams Oil-O-Matic, Div. Eureka Vacuum Cleaner Co., Bloomington, Ill. (Gun)
• Wood Industries, Inc., Gar, Detroit (Gun).
York Electric and Machine Company, York, Pa.
York-Heat Div., York-Shipley, Inc., York, Pa. (Gun).
York Corp., York Pa. (Gun).

BURRING MACHINES

See Machines, Burring

CABINETS AND CASINGS

Acme Tin Plate & Roofing Supply Co., Philadelphia.
Airwasher Corporation, Lansing, Mich.
Armstrong Furnace Company, Columbus, Ohio.
Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
Biersach & Niedermeyer Company, Milwaukee.
• Brundage Co., Kalamazoo, Mich.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Davis & Siehl Co., Cincinnati.
Edwards Manufacturing Co., Cincinnati.
Falstrom Co., Passaic, N. J.
General Metal Products Co., St. Louis.
Hauserman Co., E. F., Cleveland.
Kirk & Blum Mfg. Co., Cincinnati, O.
• Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
Lindsay Corporation, Chicago.
Maysteel Products, Inc., Milwaukee.
Mitchell Air Conditioning Co., Inc., Schenectady, N. Y.
Mullins Mfg. Corp., Warren, Ohio.
Northwest Foundry & Furnace Works, Inc., Portland, Ore.
Reliable Sheet Metal Engineering Co., Chicago (Metal).
Riester & Thesmacher Co., Cleveland.
St. Charles Mfg. Co., St. Charles, Ill.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Pressed Steel Co., Jenkintown, Pa.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Utica Products, Incorporated, Utica, N. Y.
• Waterman-Waterbury Company, Minneapolis.

CAPS AND TOPS, CHIMNEY

• Accurate Mfg. Works, Chicago. (Revolving)
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• Adams Company, The, Dubuque, Iowa.
Ames Co., W. R., San Francisco.
Bieler & Son, L., Long Island City. (Shanty and revolving)
Breidert Co., G. C., Los Angeles.
Edwards Mfg. Co., Inc., Cincinnati.
Excelsior Steel Furnace Co., Chicago.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Iwan Brothers, South Bend, Ind.
Juniper Elbow Company, Inc., Middle Village, L. I., N. Y. (Shanty and Revolving Caps).
Lamb & Ritchie Co., Cambridge, Mass.
Little Burner Co., Inc., H. C., San Rafael, Calif.
• Milcor Steel Co., Milwaukee, Wis.
Neemes Foundry, Inc., Troy, N. Y.
Northern Furnace & Supply Company, Billings, Mont.
Osborn Co., J. M. & L. A., Cleveland.
Royal-Apex Mfg. Corp., Brooklyn.

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Ryniker Steel Products Company, Billings, Mont.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Sterling Foundry Company, Sterling, Ill. (Cast iron).
Tierney Rotor Ventilator Co., Minneapolis.
Vail Mfg. Co., Fort Wayne, Ind.

CASINGS

See Cabinets and Casings

CAULKING COMPOUNDS

See Compounds, Caulking

CEILINGS, METAL

Brooklyn Metal Ceiling Co., Brooklyn.
Canton Steel Ceiling Co., New York City.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Edwards Mfg. Co., Inc., Cincinnati.
Friedley-Voshardt Co., Chicago.
Hauserman Co., E. F., Cleveland.
International Steel Company, Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Simplex Ceiling Co., New York City (Perforated Panels).
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Art Metal Co., Tiffin, O.
Wheeling Corrugating Co., Wheeling, W. Va.
Woolwine Metal Products Co., Los Angeles.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago.
• Armstrong Co., Detroit.
Botfield Refractories Co., Philadelphia.
Buckeye Products Co., Cincinnati.
Carey Co., Philip, Lockland, Ohio.
Chicago Fire Brick Company, Chicago.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos).
Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
• Elaterite Non-Metallic Products Co., Los Angeles.
Fireline Stove & Furnace Lining Co., Chicago. (Asbestos).
Glidden Company, Cleveland.
Green Fire Brick Co., A. P., Mexico, Mo.
Hercules Chemical Co., Inc., New York City.
Hetzel Roofing Products Co., Newark, N. J.
Johns-Manville, New York City.
Keasbey Co., Robert A., New York City (Asbestos).
Klee Co., George B., Cincinnati.
Krehbiel Co., J. H., Chicago.
Laclede-Christy Clay Products Co., St. Louis.
Lastik Products Co., Inc., Pittsburgh.
McLeod & Henry Co., Inc., Troy, N. Y.
Munn and Steele, Inc., Newark, N. J.
Nebel Manufacturing Co., Cleveland.
Pecora Paint Co., Philadelphia (Asbestos).
Plastic Products Co., Detroit.
Preferred Utilities Mfg. Corp., New York City.
Presstite Engineering Co., St. Louis.
Quigley Company, Inc., New York City.
Refractory & Insulation Corp., New York City.
Ruberiod Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
• Sall Mountain Co., Chicago.
Sauereisen Cements Co., Sharpsburg, Pa.
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit.
Tamms Silica Company, Chicago. (Asbestos)
Taylor Sons Co., Charles, Cincinnati, O.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Walsh Refractories Corp., St. Louis.
Wilhelm Co., A., Reading, Pa.
• Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago. (Asbestos, mineral wool and magnesia).
Alton Mineral Wool Insulation Co., Alton, Ill.
Baldwin-Hill Co., Trenton, N. J. (Rockwool).
Barrett Division, Allied Chemical & Die Corporation, New York City.
Bird Archer Co., Philadelphia.
Botfield Refractories Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio (Asbestos, Mag., Rockwool).
Carney Rockwell Co., Mankato, Minn. (Rockwool).
Chicago Fire Brick Co., Chicago (Asbestos).
Clinton Metallic Paint Co., Clinton, N. Y.
Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Eagle-Picher Co., Cincinnati. (Asbestos)
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Asbestos).
Green Fire Brick Company, A. P., Mexico, Mo. (Vermiculite).
Industrial Research, Lansdowne, Pa.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York City (Asbestos).
Keasbey Co., Robert A., New York City (Asbestos).
Keasbey & Mattison Co., Ambler, Pa. (Asbestos).
Krehbiel Co., J. H., Chicago (Asbestos, mineral wool).
McLeod & Henry Co., Inc., Troy, N. Y.
Munn and Steele, Inc., Newark, N. J. (Vermiculite).
National Gypsum Co., Buffalo. (Rock wool).
Nelson Mfg. Co., B. F., Minneapolis (Vermiculite, Asbestos).
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ohmlac Paint & Refining Co., Chicago (Asphalt, Asbestos).
Owens-Corning Fiberglas Corp., Toledo, O. (Mineral wool)
Plant Rubber & Asbestos Works, Inc., San Francisco (Asbestos).
Plibrico Jointless Firebrick Co., Chicago. (Mineral wool).
Poe Co., C. W., Cleveland (Mineral Wool).
Preferred Utilities Mfg. Corp., New York City.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City (Asbestos).
Ramtite Co., Div. of S. Obermayer Co., Chicago.
Refractory & Insulation Corp., New York City (Wool).
Rex Clay Products Co., Detroit.
Robinson Insulation Co., Great Falls, Mont. (Vermiculite).
Rock Fleece Co., El Paso, Texas.
Ruberoid Co., New York City (Asbestos).
Rutland Fire Clay Co., Rutland, Vt. (Asbestos)
• Sall Mountain Co., Chicago.
Sauereisen Cements Co., Pittsburgh.
Schundler & Co., Inc., F. E., Joliet, Ill.
Smith & Kanzler Corp., Elizabeth, N. J. (Asbestos).
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit (Rock wool and asbestos).
Tennessee Products Corp., Nashville, Tenn. (Mineral Wool).
Therminsul Corp., Kalamazoo, Mich.
Thompson & Co., Oakmont (Pittsburgh Dist), Pa.
United States Mineral Wool Co., Chicago (High temperature mineral wool).
Universal Zonolite Insulation Co., Chicago (Vermiculite).
Westinghouse Electric Corporation, East Pittsburgh, Pa.
• Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, REFRACTORY

See Refractories

CEMENT, ROOF

Acme Asbestos Covering & Flooring Co., Chicago.
Acme Refining Co., Cleveland (Liquid and plastic).
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
All States Roofers Equipment & Material Co., Chicago.
American-Marietta Company, Chicago.
• Armstrong Co., Detroit.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Bird & Son, Inc., East Walpole, Mass.
Blue Ridge Talc Co., Inc., Henry, Va.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio.
Carter Paint Co., Liberty, Ind.
Celotex Corp., Chicago.
Certain-teed Products Corp., New York City.
Clinton Metallic Paint Co., Clinton, N. Y.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt).
Johns-Manville, New York City.
Koppers Company, Inc., Pittsburgh.
Krehbiel Co., J. H., Chicago (Asphaltic, Gilsonite, Elaterite).
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Midland Paint & Varnish Co., Cleveland (Fiberseal).
Miller & Son, C. Arthur, Elmira, N. Y.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis (Master Asphalt).
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago.
Pecora Paint Co., Philadelphia (Asbestos).
Presstite Engineering Co., St. Louis.
Rock Fleece Company, El Paso, Texas.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Smooth-On Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
United States Gypsum Co., Chicago.
Wilhelm Co., A., Reading, Pa.

CHAIN, FURNACE

American Chain Div., American Chain & Cable Co., Inc., York, Pa.
Bead Chain Mfg. Co., Bridgeport, Conn.
Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
Corbin Screw Corp., New Britain, Conn.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hodell Chain Co., Cleveland.

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McKay Co., York, Pa.
Russell Mfg. Co., John M., Naugatuck, Conn.
Turner & Seymour Mfg. Co., Torrington, Conn.
• United States Register Co., Battle Creek, Mich.

CHAMBERS, COMBUSTION, PREFORMED

Barclay, Inc., Robert, Chicago.
Chicago Fire Brick Company, Chicago.
Commonwealth Products Co., Philadelphia.
Gilbert & Son, Harry E., Bridgeport, Conn. (Radiant Silicons)
Green Fire Brick Company, A. P., Mexico, Mo.
Harvey, Inc., Sid, Valley Stream, N. Y.
McLeod & Henry Co., Inc., Troy, N. Y.
Monogram Combustion Chamber Co., Philadelphia.
Munn and Steele, Inc., Newark, N. J. (Light fired refractory).
Peterson Co., B. A., Dowagiac, Mich.
Preferred Utilities Manufacturing Corp., New York City.
Rex Clay Products Company, Detroit.
Universal Zonolite Insulation Co., Chicago (Vermiculite concrete).

CHANGERS, SPEED, MECHANICAL

Allis-Chalmers Mfg. Co., Milwaukee.
DoAll Co., Des Plaines, Ill.
Ideal Commutator Dresser Co., Sycamore, Ill.
Lewellen Mfg. Co., Columbus, Ind.
Link-Belt Co., Chicago.
Reeves Pulley Co., Columbus, Ind.

CHANNELS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

CHEMICALS, RUST PREVENTIVE FOR PRETREATING METALS

American Chemical Paint Co., Ambler, Pa.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Neilson Chemical Co., Detroit.
North American Fibre Products Co., Cleveland.
Oakite Products, Inc., New York City.
Parker Rust-Proof Co., Detroit.
Pennsylvania Salt Mfg. Co., Philadelphia.
Protective Coatings, Inc., Detroit.
Rust Products Co. of America, Chicago.
Rusticide Products Co., Cleveland.
Standard Steel Spring Co., Gary, Ind.
Technical Processes Div., Colonial Alloys Co., Philadelphia.
Truscon Laboratories, Detroit.
Turco Products, Inc., Los Angeles.
Western Reserve Laboratories, Cleveland.
Wolfe-Kote Co., Sheboygan, Wis.

CHIMNEY CAPS

See Caps and Tops, Chimney

CHIMNEY LININGS

See Linings, Chimney

CLEANERS FOR STAINLESS STEEL

American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York City.
Pennsylvania Salt Mfg. Co., Philadelphia.
Turco Products, Inc., Los Angeles.

CLEANERS, POLISHERS AND FINISHERS, METAL

(Liquid, Paste and Powder)

• Allen Co., L. B., Inc., Chicago.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
NuSteel Company, Chicago.
Oakite Products, Inc., New York City.
Pennsylvania Salt Mfg. Co., Philadelphia.
Quigley Company, Inc., New York City (Powder, Cake).
Tamms Silica Company, Chicago.
Turco Products, Inc., Los Angeles.
Wolfe-Kote Co., Sheboygan, Wis. (Liquid).

CLEANERS, VACUUM, PURNACE

Baker Furnace & Cleaner Mfg. Co., Toledo, O.
• Breuer Electric Mfg. Co., Chicago.
Clements Mfg. Co., Chicago.
Densmore-Quinlan Co., Kenosha, Wis.
Dickson Coal Co., New York City.
• Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Electric Vacuum Cleaner Co., Inc., Cleveland.
Ideal Commutator Dresser Co., Sycamore, Ill.
Kent Co., Inc., Rome, N. Y.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
• National Super Service Co., Toledo, O.
Spencer Turbine Co., Hartford, Conn.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.

CLEAT BENDERS

See Machines, Cleat Bending

CLEATS, DRIVE

See Connectors, Metal, for Metal Ducts

CLIPS, FASTENING, FOR ROOFING

American Sheet Metal Works, New Orleans, La.
Bard Manufacturing Co., Bryan, O.
• Berger Brothers Co., Philadelphia.
Bridesburg Foundry Co., Philadelphia.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Edwards Mfg. Co., Inc., Cincinnati.
• Milcor Steel Co., Milwaukee.
Osborn Co., J. M. & L. A., Cleveland.
Pfeifer, Wm., New York City.
Southbridge Roofing Co., Inc., Southbridge, Mass.

CLIPS AND TIPS, DAMPER

• Adams Company, The, Dubuque, Iowa.
• Air Control Products, Inc., Coopersville, Mich.
• Berger Bros. Co., Philadelphia.
• Gerett Co., M. A., Milwaukee.
Goese Mfg. Co., Milwaukee.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Griswold Mfg. Co., Erie, Pa.
• Hart & Cooley Mfg. Co., Holland, Mich.
Howes-Woods Company, Cambridge, Mass.
Kerentoff, G. L., Cincinnati.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
Schoedinger, F. O., Columbus, Ohio.
• United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland.

CLOTH AND NETTING, WIRE

Acme Wire & Iron Works, Detroit.
Buffalo Wire Works Company, Buffalo.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Cyclone Fence Division, American Steel & Wire Co., Waukegan, Ill.
Downs-Smith Brass & Copper Co., Inc., New York City.
Korb-Pettit Wire Fabrics & Iron Works, Inc., Philadelphia.
Logan Co., Inc., Louisville, Ky. (Heavy)
Meyers Mfg. Co., Fred L., Hamilton, Ohio.
New York Wire Works, Inc., Newark, N. J.
Rolock, Incorporated, Fairfield, Conn.
Wheeling Corrugating Company, Wheeling, W. Va.
Wickwire Spencer Steel Co., New York City.

CO_2 ANALYZERS

See Analyzers, CO_2

COAL BURNERS, AUTOMATIC

See Stokers

COATINGS, PROTECTIVE, METAL

Blue Ridge Talc Co., Inc., Henry, Va.
Cordo Chemical Corp., Norwalk, Conn.
Galv-Weld Products, Dayton, O.
Goodrich Co., B. F., Akron, O.
Mortell Co., J. W., Kankakee, Ill.
Protective Coatings, Inc., Detroit.
Socony Paint Products Div. of Socony-Vacuum Oil Co., Inc., New York City.
Wilbur & Williams Co., Boston.

COILS, COOLING, DIRECT EXPANSION, FINNED

Acme Industries, Inc., Jackson, Mich.
• Aerofin Corp., Syracuse, N. Y.
• Airtemp Division, Chrysler Corp., Dayton, O.
American Coils, Inc., Newark, N. J.
Beacon-Morris Corp., Boston, Mass.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Co., Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Div., General Motors Corp., Dayton, Ohio.
G & O Mfg. Co., New Haven, Conn.
• General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Griscom-Russell Co., The, New York City.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Mario Coil Co., St. Louis.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Company, New York City.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Reliance Refrigerating Machine Co., Chicago.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Galvanizing Co., Chicago.

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Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Super Radiator Corp., Minneapolis.
Trane Co., La Crosse, Wis.
• United States Air Conditioning Corp., Minneapolis.
Vilter Mfg. Co., Milwaukee.
X L Refrigerating Company, Inc., Chicago.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COILS, COOLING, WATER

Acme Industries, Inc., Jackson, Mich.
• Aerofin Corp., Syracuse, N. Y.
• Airtemp Division, Chrysler Corp., Dayton, O.
Beacon-Morris Corp., Boston.
Bell & Gossett Co., Morton Grove, Ill.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Company, Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Division, General Motors Corporation, Dayton, O.
G & O Mfg. Co., New Haven, Conn.
• General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Griscom-Russell Co., The, New York City.
Industrial Mfg. & Eng. Co., Chicago.
Johnson Fan & Blower Corp., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Mario Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia.
Niagara Blower Company, New York City.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Galvanizing Co., Chicago.
Standard Heater & Oil Equipment Co., Jersey City, N. J.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Super Radiator Corp., Minneapolis.
Trane Co., La Crosse, Wis.
• United States Air Conditioning Corporation, Minneapolis.
Vilter Mfg. Co., Milwaukee.
Whitlock Manufacturing Co., Hartford, Conn.
Wing Manufacturing Co., L. J., New York City.
X L Refrigerating Co., Inc., Chicago.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COILS, FIRE POT, HOT WATER

• Adams Company, The, Dubuque, Iowa.
• Air Controls, Inc., Cleveland.
Bell & Gossett Co., Morton Grove, Ill.
• Brauer Supply Co., A. G., St. Louis.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Globe Machinery & Supply Co., Des Moines, Ia.
• Harvey-Whipple, Inc., Springfield, Mass.
Hotstream Heater Co., Cleveland.
Lennox Furnace Co., Marshalltown, Ia.
Marshall Furnace Co., Marshall, Mich.
Miller & Son, C. Arthur, Elmira, N. Y.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee.
Murray Mfg. Co., D. J., Wausau, Wis.
Rempe Co., Chicago.
Rome-Turney Radiator Co., Rome, N. Y.
• Rudy Furnace Co., Dowagiac, Mich.

COILS, HEATING

• Aerofin Corp., Syracuse, N. Y.
• Bayley Blower Co., Milwaukee.
Beacon-Morris Corporation, Boston.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City, Mo.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Company, Chicago.
Drayer-Hanson, Inc., Los Angeles.
Extended Surface, Inc., Brooklyn, N. Y.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Division, General Motors Corporation, Dayton, O.
G & O Mfg. Co., New Haven, Conn.
• General Electric Co., Bloomfield, N. J.
Griscom-Russell Co., New York City.
Industrial Mfg. & Eng. Co., Chicago.
Johnson Fan & Blower Corp., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard Corporation, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Corporation, Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Mario Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia.
New York Blower Co., Chicago.
Niagara Blower Co., New York City.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, Ohio.
Rempe Co., Chicago.
Roessing Manufacturing Co., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Heater and Oil Equipment Co., Jersey City.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Super Radiator Corp., Minneapolis.
Trane Co., La Crosse, Wis.
• United States Air Conditioning Corporation, Minneapolis.
Whitlock Mfg. Co., Hartford, Conn.
Wing Mfg. Co., L. J., New York City.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COLLECTORS, BLOW PIPE

Aget-Detroit Co., Ann Arbor, Mich.
Allen Billmyre Co., Mamaroneck, N. Y.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., Detroit.
American Foundry Equipment Co., Mishawaka, Ind.
American Metal Products Co., Fort Worth, Texas.
Bargar Sheet Metal Co., Cleveland.
• Bayley Blower Co., Milwaukee.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Centri-Spray Co., Detroit.
Clark Dust Control Company, Chicago.
Day Co., Minneapolis.
Dracco Corp., Cleveland.
Garden City Fan Co., Chicago.
Goethel Sheet Metal Works, Alfred, Milwaukee.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
• Indiana Fan Co., Indianapolis, Ind.
Jacobs Co., B. & J., Cincinnati.
Kirk & Blum Mfg. Co., Cincinnati.
Kluegel & Co., E., St. Paul, Minn.
Knickerbocker Co., Jackson, Mich.
Kopperman & Sons, Joseph, Philadelphia.
Lumm Co., A. H., Toledo, Ohio.
Northern Blower Co., Cleveland.
Pangborn Corp., Hagerstown, Md.
Peters-Dalton, Inc., Detroit.
Prat-Daniel Corp., Port Chester, N. Y.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Research Corp., New York City.
Ruemelin Mfg. Co., Milwaukee.
Schmieg Industries, Detroit.
Schneible Co., Claude B., Detroit.
Skinner Heating & Vent Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Sly Mfg. Co., W. W., Cleveland.
Southbridge Roofing Company, Inc., Southbridge, Mass.
Spencer Turbine Co., Hartford, Conn.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Torit Manufacturing Co., St. Paul, Minn.
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles.
• Whiting Corporation, Harvey, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.
Young & Bertke Co., Cincinnati.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMPOUNDS, CAULKING

Accurate Metal Weather Strip Co., New York City.
Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Company, Cleveland.
Allmetal Weatherstrip Co., Chicago.
American-Marietta Company, Chicago.
American Metal Weather Strip Co., Grand Rapids, Mich.
• Armstrong Co., Detroit.
Babbitt Chemical Specialties Co., New York City.
Barland Weatherstrip Material Co., Cleveland.
Blue Ridge Talc Co., Inc., Henry, Va.

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Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio.
Carter Paint Co., Liberty, Ind.
Chamberlin Company of America, Detroit.
Cheesman-Elliot Company, Inc., Brooklyn.
Clinton Metallic Paint Co., Clinton, N. Y.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Eagle-Picher Co., Cincinnati, O.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Company, Cleveland.
Goodrich Co., B. F., Akron, O.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Irvington Varnish & Insulator Co., Irvington, N. J.
Johns-Manville, New York City.
Krehbiel Co., J. H., Chicago.
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Maas and Waldstein Co., Newark, N. J.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
Mortell Co., J. W., Kankakee, Ill.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmiac Paint & Refining Co., Chicago (Asphalt).
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Plastic Products Co., Detroit.
Presstite Engineering Co., St. Louis.
Quigley Company, Inc., New York City.
Radiator Specialty Co., Charlotte, N. C.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Company, James B., Pittsburgh.
Smooth-on Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Company, Savannah, Ga.
Tamms Silica Company, Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Wilhelm Co., A., Reading, Pa.
X-Pando Corp., Long Island City, N. Y.
Yardley Venetian Blind Co., Columbus, Ohio.

COMPOUNDS, CLEANING

Carolina Aniline & Extract Co., Inc., Charlotte, N. C. (Humidifying systems)

COMPOUNDS, GLAZING

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Company, Cleveland.
• Armstrong Co., Detroit.
Blue Ridge Talc. Co., Inc., Henry, Va.
Calbor Paint & Varnish Co., Philadelphia.
Chamberlin Co. of America, Detroit.
Continental Products Co., Euclid, O.
Glidden Company, Cleveland.
Goodrich Co., B. F., Akron, O.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Lastik Products Co., Inc., Pittsburgh.
Midland Paint & Varnish Co., Cleveland.
Mortell Co., J. W., Kankakee, Ill.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Company, Pittsburgh.
Plastic Products Co., Detroit.
Presstite Engineering Co., St. Louis.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Company, Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
X-Pando Corporation, Long Island City, N. Y.

COMPOUNDS, TINNING

American Solder & Flux Co., Philadelphia.
Burnley Battery & Mfg. Co., North East, Pa.
Eagle-Picher Co., Cincinnati.
Farelloy Company, Inc., Philadelphia.
Glaser Lead Co., Inc., Brooklyn.
• Johnson Co., Lloyd S., Chicago.
• Lukens Metal Co., Thos. F., Philadelphia.
Motex Metal Process Corporation, Detroit.
Potomac Mfg. Co., Philadelphia.
• Ruby Chemical Co., Columbus, O.
Tinit Manufacturing Co., Inc., Denver, Colo.
Turco Products, Inc., Los Angeles.

COMPOUNDS, WATER-PROOFING

Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American Asphalt Roof Corp., Kansas City, Mo.
Baldwin-Hill Company, Trenton, N. J.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Blue Ridge Talc Co., Inc., Henry, Va.
Carey Co., Philip, Lockland, Ohio.
Continental Products Co., Euclid, Ohio.
Devoe & Raynolds Co., Inc., New York.
Eastern States Supply Co., Brooklyn, N. Y.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flintkote Co., New York City.
Ford Roofing Products Company, Chicago.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., The, Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Johns-Manville, New York City.
Koppers Co., Inc., Pittsburgh.
Lastik Products Co., Inc., Pittsburgh.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Pecora Paint Co., Philadelphia.
Presstite Engineering Co., St. Louis.
Protective Coatings, Inc., Detroit.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh (Processed Asphalt).
Sauereisen Cements Co., Sharpsburg, Pa.
Self-Vulcanizing Rubber Co., Inc., Chicago.
Sherwin-Williams Co., Cleveland.
Sipe & Company, James B., Pittsburgh.
Smooth-On Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Truscon Laboratories, Detroit.
Wailes Dove-Hermiston Corporation, Westfield, N. J.
Wilhelm Co., A., Reading, Pa.
X-Pando Corp., Long Island City, N. Y.

COMPOUNDS, WELDING

American Solder & Flux Co., Philadelphia.
• Johnson Co., Lloyd S., Chicago.
Midland Paint & Varnish Co., Cleveland.
Turco Products, Inc., Los Angeles.
Universal Power Corporation, Cleveland.
Wolfe-Kote Co., Sheboygan, Wis.

COMPRESSORS, REFRIGERATING

Air Conditioning and Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
• Airtemp Division, Chrysler Corp., Dayton, O.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Copeland Refrigeration Corp., Sidney, Ohio.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis.
Diceler Corp., Gasport, N. Y.
Frick Co., Waynesboro, Pa.
Frigidaire Division, General Motors Corporation, Dayton, O.
• General Electric Co., Bloomfield, N. J.
General Machinery Co., Spokane, Wash. (Ammonia).
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Howe Ice Machine Co., Chicago.
Ingersoll-Rand, New York City.
Kauffman Air Conditioning Corp., St. Louis.
Kelvinator Div., Nash-Kelvinator Corp., Detroit.
Lynch Manufacturing Corporation, Defiance, O.
Merchant & Evans Co., Philadelphia.
Mills Novelty Co., Chicago.
Phoenix Ice Machine Co., Cleveland.
Reliance Refrigerating Machine Co., Chicago.
Reynolds Manufacturing Co., Springfield, Mo.
Servel, Inc., Evansville, Ind.
Starr Piano Co., Richmond, Ind.
Stewart Ice Machine Co., Los Angeles.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Tecumseh Products Co., Tecumseh, Mich.
Trane Co., La Crosse, Wis.
Universal Cooler Corp., Marion, Ohio.
Vilter Mfg. Co., Milwaukee.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
Wittenmeier Machinery Co., Chicago.
X L Refrigerating Co., Chicago.
Yeomans Brothers Co., Chicago.
York Corp, York, Pa.

CONDUCTOR PIPE

See Pipe, Conductor

CONNECTIONS, DUCT, FLEXIBLE

(Asbestos, Canvas, etc.)

Canvas Products Co., St. Louis.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Chicago Metal Hose Corp., Maywood, Ill.
Felter Co., The, Boston.
United States Rubber Co., New York City.
• Wilson, Inc., Grant, Chicago (Asbestos).

CONNECTORS, METAL, FOR METAL DUCTS (Drive Cleat)

• Char-Gale Mfg. Co., Minneapolis.
Corbman Bros., Inc., Philadelphia.
• International Heater Co., Utica, N. Y.
• Milcor Steel Company, Milwaukee.
• Waterman-Waterbury Co., Minneapolis.

CONTROL SYSTEMS, FORCED AIR FURNACE, HAND-FIRED (PACKAGE)

(Bonnet Control of Blower)

Barber-Colman Co., Rockford, Ill.
Barclay, Inc., Robert, Chicago.
Cook Electric Co., Chicago.
Crown Controls Co., New Bremen, Ohio.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROL SYSTEMS, FORCED AIR FURNACE, HAND-FIRED (PACKAGE)

(Thermostat Control of Blower)

Barber-Colman Co., Rockford, Ill.
Cook Electric Co., Chicago.
• General Controls Co., Glendale, Calif.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROL SYSTEMS, GRAVITY FURNACE, HAND-FIRED (PACKAGE)

• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.
Cook Electric Co., Chicago.
• Crise Electric Mfg. Co., Columbus, Ohio.
Crown Controls Co., New Bremen, Ohio.
Defender Instrument and Regulator Co., St. Louis.
• General Controls Co., Glendale, Calif.
• Gleason-Avery, Inc., Auburn, N. Y.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROL SYSTEMS, ZONE DISTRIBUTION, COMPLETE

Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Cook Electric Co., Chicago.
Dunham Co., C. A., Chicago.
• General Controls Co., Glendale, Cal.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Sampsel Time Control, Inc., Spring Valley, Ill.

CONTROLS, BLOWER, SPEED CHANGING

National Thermal Drive Co., Inc., St. Paul. (Thermal)
Webster Electric Co., Racine, Wis. (Thermal)
• White Manufacturing Co., St. Paul. (Thermal)

CONTROLS, COMBINED FAN AND LIMIT, LINE VOLTAGE

• Automatic Products Co., Milwaukee.
Defender Instrument and Regulator Co., St. Louis.
• Detroit Lubricator Co., Detroit.
• General Controls Co., Glendale, Cal.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, COMBINED FAN AND LIMIT, LOW VOLTAGE

Cook Electric Co., Chicago.
Defender Instrument and Regulator Co., St. Louis.
• Detroit Lubricator Co., Detroit.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LINE VOLTAGE

Barber-Colman Co., Rockford, Ill.
Cook Electric Co., Chicago.
• General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.

CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LOW VOLTAGE

Cook Electric Co., Chicago.
Crown Controls Co., New Bremen, Ohio.
• General Controls Co., Glendale, Cal.
Hotstream Heater Co., Cleveland.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Photoswitch, Inc., Cambridge, Mass. (Electric eye)
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.

CONTROLS, DRAFT, BAROMETRIC

(See also Hoods, Draft, Gas)

Atlas Valve Co., Newark, N. J.
Barber-Colman Company, Rockford, Ill.
• Cole-Sullivan Engineering Co., Minneapolis.
Empire Ventilation Equipment Co., Long Island City, N. Y.
• Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Herd Utilities, Inc., Providence, R. I. (Thermostatic).
Hotstream Heater Co., Cleveland. (Automatic).
James Regulator Co., Inc., Pottsville, Pa.
Kieley & Mueller, Inc., North Bergen, N. J.
Mason-Neilan Regulator Co., Dorchester, Mass.
• Perfex Corporation, Milwaukee.
Platt Products Corporation, Lansing, Mich.
Polk Mfg. Co., Madison, Wis. (Combination).
Preferred Utilities Mfg. Corp., New York City.
Simplex Manufacturing Co., Fond du Lac, Wis.
• Walker Mfg. & Sales Corp., St. Joseph, Mo.
Wheelco Instrument Co., Chicago.

CONTROLS, EFFECTIVE TEMPERATURE

Barber-Colman Co., Rockford, Ill.
Crown Controls Co., New Bremen, Ohio.
Friez Instrument Division, Towson, Md.
Fulton Syphon Co., Knoxville, Tenn.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Tagliabue Div., C. J., Brooklyn.

CONTROLS, FAN, LINE VOLTAGE

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.
Clark Controller Co., Cleveland.
Cook Electric Co., Chicago.
• Detroit Lubricator Co., Detroit.
• Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Paragon Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
Ranco, Inc., Columbus, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, FAN, LOW VOLTAGE

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

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Barber-Colman Co., Rockford, Ill.
Clark Controller Co., Cleveland.
Cook Electric Co., Chicago.
• Detroit Lubricator Co., Detroit.
• Gleason-Avery, Inc., Auburn, N. Y.
McCorkle Co., D. H., Berkeley, Calif.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
Pioneer Heat Regulator Div , Master Electric Co., Dayton, O
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, PNEUMATIC

Adel Precision Products Corp., Burbank, Calif. (Hydraulic, remote)
Atlas Valve Co., Newark, N. J.
Bristol Co., Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Co., Knoxville, Tenn.
Johnson Service Co., Milwaukee.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Powers Regulator Co., Chicago.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

CONTROLS, LIMIT, LINE VOLTAGE

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Cook Electric Co., Chicago.
• Detroit Lubricator Co., Detroit.
General Electric Co., Schenectady, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, LIMIT, LOW VOLTAGE

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
• Automatic Products Co., Milwaukee.
Cook Electric Co., Chicago.
Crown Controls Co., New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
General Electric Co., Schenectady, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
McCorkle Co., D. H., Berkeley, Calif.
• Mercoid Corp., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Mueller Furnace Co., L. J., Milwaukee.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, OIL BURNER, COMPLETE ASSEMBLY

Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Defender Instrument and Regulator Co., St. Louis.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Wheelco Instruments Co., Chicago.

CONTROLS, STOKER, COMPLETE ASSEMBLY

Au-Temp-Co Corp., New York City.
Defender Instrument and Regulator Co., St. Louis.
• Detroit Lubricator Co., Detroit.
• Gleason-Avery, Inc., Auburn, N. Y.
• Mercoid Corporation, Chicago, Ill.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Palmer Electric Co., Chicago.
• Paragon Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarcotherm Controls, Inc., Chicago.
• White-Rodgers Electric Co., St. Louis.

CONTROLS, WINDOW CONDENSATION

Friez Instrument Div., Towson, Md.

COOLING SURFACE

See Coils, Cooling, Water

COPPERS, SOLDERING

• American Brass Co., Waterbury, Conn.
Berns Co., Otto, Rochester, N. Y.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Clendenin Brothers, Inc., Baltimore.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., Inc., New York City.
• Dual-Heat Iron Co., Los Angeles. (Electric)
Dual Remote Control Co., Wayne, Mich.
Electric Materials Co., North East, Pa.
Electric Soldering Iron Co., Inc., Deep River, Conn. (Electric)
Everhot Mfg. Co., Maywood, Ill.
General Electric Co., Schenectady, N. Y.
Hexacon Electric Co., Roselle Park, N. J. (Electric)
• Hussey & Co., C. G., Pittsburgh.
Ideal Cummutator Dresser Co., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago.
Lenk Mfg. Co., Newton Lower Falls, Mass.
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
• Peck, Stow & Wilcox Co., Southington, Conn.
Ransome Company, Emeryville, Calif. (Gas)
• Reiner & Campbell Co., Inc., Elizabeth, N. J. (Carbide)
• Revere Copper & Brass, Inc., New York City.
Sheet Metal Mfg. Co., Brooklyn.
Sight Feed Generator Co., Richmond, Ind.
Sound Equipment Corp., Glendale, Cal. (Thermostatic-electric)
Stanley Tools, New Britain, Conn.
Sta-Warm Electric Co., Ravenna, O.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Vulcan Electric Co., Danvers, Mass.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Weiss & Co., H., New York City.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Couplings Co., Westfield, N. Y.
American Flexible Coupling Co., Erie, Pa.
Bartlett Hayward Co., Baltimore.
Blood Brothers Machine Co., Allegan, Mich. (Universal joints)
Boston Gear Works, Inc., North Quincy, Mass.
Browning Manufacturing Co., Inc., Maysville, Ky.
Caldwell Co., W. E., Louisville, Ky.
Certified Flexible Couplings, New York City.
Chain Belt Co., Milwaukee.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit.
Continental Diamond Fibre Co., Newark, Del.
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Diamond Chain & Mfg. Co., Indianapolis.
Dodge Mfg. Co., Mishawaka, Ind.
Guardian Utilities Co., Michigan City, Ind.
Jones Foundry Machine Co., W. A., Chicago.
Link-Belt Co., Chicago.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago.
Medart Co., St. Louis.
Mercury Clutch Corporation, Canton, O.
Moran Flexible Steam Joint Co., Louisville, Ky.
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Works, Inc., Philadelphia.
Poole Foundry & Machine Co., Baltimore.
Ramsey Chain Co., Inc., Albany, N. Y.
Stewart-Rogers, Inc., Philadelphia.
Stow Manufacturing Co., Binghamton, N. Y.
Thermoid Rubber Div. of Thermoid Co., Trenton, N. J.
United States Rubber Co., New York City.
Waldron Corp., John, New Brunswick, N. J.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Whitney Chain & Mfg. Co., The, Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

CRANES, OVERHEAD TRAVELING—Hand and Power

American Chain Div., American Chain & Cable Co., Inc., York, Pa.
• American Monorail Co., Cleveland.
Chicago Tramrail Co., Chicago.
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
Consolidated Steel Corp., Ltd., Los Angeles.
Euclid Crane & Hoist Co., Cleveland.
Harnischfeger Corporation, Milwaukee.
Judson Pacific Co., San Francisco.
Louden Co., Fairfield, Iowa.
Reading Chain & Block Corp., Reading, Pa.
Richards-Wilcox Manufacturing Co., Aurora, Ill.

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• Riverside Machinery Co., Chicago.
Robbins & Myers, Inc., Springfield, Ohio.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
• Whiting Corp., Harvey, Ill.
Wright Manufacturing Division, American Chain & Cable Co., Bridgeport, Conn.

CRIMPING MACHINES

See Machines, Crimping

DAMPER MOTORS

See Motors, Damper, Furnace Draft, Electrical

DAMPER CONTROLS

See Regulators, Damper Sets

DAMPER REGULATOR SETS

See Regulators, Damper Sets

DAMPERS, FOR WARM AIR PIPE

• Adams Co., Dubuque, Ia.
Excelsior Steve & Mfg. Co., Quincy, Ill.
• Hart & Cooley Mfg. Co., Holland, Mich.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y. (Tin)
Lennox Furnace Co., Marshalltown, Ia.
• May-Fiebeger Company, Newark, Ohio.
• Peerless Foundry Co., Inc., Indianapolis.
Sheet Metal Mfg. Co., Inc., Brooklyn.
• United States Register Co., Battle Creek, Mich.

DAMPERS, SMOKE PIPE

• Adams Co., The, Dubuque, Ia.
• Brauer Supply Co., A. G., St. Louis, Mo.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
• Char-Gale Mfg. Co., Minneapolis.
Dickson Coal Co., New York City.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Eselgroth & Co., Newark, N. J.
• Forest City Foundries Co., Niagara Furnace Div., Cleveland. (Check Damper)
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Griswold Mfg. Co., Erie, Pa.
Hotstream Heater Co., Cleveland.
Howes-Woods Company, Cambridge, Mass.
James Regulator Co., Inc., Pottsville, Pa. (For water heaters)
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y. (Cast Iron)
Keith Furnace Co., Des Moines, Ia.
Maple City Furnace Co., Monmouth, Ill.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
• Peerless Foundry Co., Inc., Indianapolis.
Preferred Utilities Manufacturing Corp., New York City.
Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
• United States Register Co., Battle Creek, Mich.
• Walker Mfg. & Sales Corp., St. Joseph, Mo.
• Williamson Heater Co., Cincinnati.

DAMPERS, STACK HEAD

• Air Conditioning Products Co., Detroit.
Barber-Colman Co., Rockford, Ill.
• Henry Furnace Co., Medina, Ohio.
Young Regulator Co., Cleveland.

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

Air and Refrigeration Corp., New York City.
Aqua-Sorb Co., East Orange, N. J.
Bryant Heater Co., Cleveland. (Silica gel.)
Carbide and Carbon Chemicals Corp., New York City (Triethylene glycol).
Cargoaire Engineering Corp., New York City. (For ships).
Carrier Corp., Syracuse, N. Y.
Davison Chemical Corp., Baltimore, Md.
Drying Systems, Inc., Chicago, Ill.
Floridin Co., Warren, Pa.
Kaufman Co., H. J., Detroit. (Absorption).
Pittsburgh Lechtrodryer Corp., Pittsburgh. (Adsorption).
Rogers Diesel & Air Craft Corp., New York.
Solvay Sales Corp., New York City.
• Surface Combustion, Toledo, Ohio.
Tamms Silica Co., Chicago.

DIES

See Presses and Dies

DIFFUSERS, AIR, HIGH VELOCITY

• Air Devices, Inc., New York City.
• Anemostat Corporation of America, New York City.
Barber-Colman Co., Rockford, Ill.
• Connor Eng. Corp., New York City. (High velocity)
Demuth & Sons, Charles, Mineola, L. I., N. Y.
Guth Co., Edwin F., St. Louis. (Ventilating, Diffusing, Terminals)
• Tuttle & Bailey, Inc., New Britain, Conn.
• Waterloo Register Co., Waterloo, Ia.
Wilster, Inc., Cleveland.

DOORS, HOLLOW METAL

Advance Insulating Co., Pittsburgh.
American Sheet Metal Works, New Orleans.
Bayer Co., A. J., Los Angeles.
Biersach & Niedermeyer Co., Milwaukee.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Decatur Iron & Steel Co., Decatur, Ala.
Detroit Steel Products Co., Detroit.
Edwards Mfg. Co., Inc., Cincinnati.
Hauserman Co., E. F., Cleveland.
International Steel Co., Evansville, Ind.
Jamestown Metal Corp., Jamestown, N. Y.
Kawneer Co., Niles, Mich.
Maysteel Products, Inc., Milwaukee.
Metal Door & Trim Co., La Porte, Ind.
Perkinson & Brown, Chicago.
Richmond Fireproof Door Co., Richmond, Ind.
Truscon Steel Co., Youngstown, O.

DOORS, KALAMEIN

American Sheet Metal Works, New Orleans.
Biersach & Niedermeyer Co., Milwaukee.
Dusing & Hunt, Inc., Buffalo.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Mahon Co., R. C., Detroit.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati
Newman Brothers, Inc., Cincinnati.
Overly Manufacturing Co., Greensburg, Pa.
Perkinson & Brown, Chicago.
Richmond Fireproof Door Co., Richmond, Ind.
Syracuse Fire Door Corp., Syracuse, N. Y.

DOORS AND SHUTTERS, FIRE

American Sheet Metal Works, New Orleans.
Bardes Range & Foundry Co., E. H., Cincinnati.
Biersach & Niedermeyer Co., Milwaukee.
Cornell Iron Works, Inc., Long Island City, N. Y.
Dusing & Hunt, Inc., Buffalo.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Gehri Co., Tacoma, Wash.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Jamar Co., Walker, Duluth, Minn.
Kinnear Mfg. Co., Columbus, O.
Mahon Co., R. C., Detroit.
Maysteel Products, Inc., Milwaukee.
Merchant & Evans Co., Philadelphia.
Meyer Manufacturing Co., Detroit.
Meyers Mfg. Co., Fred L., Hamilton, O.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Overly Manufacturing Co., Greensburg, Pa.
Perkinson & Brown, Chicago.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Richmond Fireproof Door Co., Richmond, Ind.
Saino Mfg. Co., Inc., F. L., Memphis, Tenn.
• Schwab Safe Co., Lafayette, Ind.
Syracuse Fire Door Corp., Syracuse, N. Y.
Western Wire & Iron Works, Inc., Chicago.
• Willis Steel Corporation, Galesburg, Ill.

DRAFT DIVERTERS FOR GAS HEATERS

Bastian-Morley Co., Inc., La Porte, Ind.
Hotstream Heater Co., Cleveland.
Maysteel Products, Inc., Milwaukee.
• Payne Furnace Co., Beverly Hills, Calif.
Simplex Manufacturing Co., Fond du Lac, Wis.
Wilder Mfg. Co., Niles, Ohio.

DRAFT GAGES

See Gages, Draft

DRAFT REGULATORS

See Regulators, Furnace Draft, Mechanical

DRILLS, ELECTRIC, PORTABLE

Albertson & Co., Inc., Sioux City, Iowa.
• Black & Decker Mfg. Co., Towson, Md.
Chicago Pneumatic Tool Co., New York City.
Cincinnati Electrical Tool Co., Cincinnati.
Clark, Jr., Electric Co., Jas., Louisville, Ky.
Cleveland Pneumatic Tool Co., Cleveland. (Pneumatic)
Duro Metal Products Co., Chicago.
• Independent Pneumatic Tool Co., Chicago.
Keller Tool Company, Grand Haven, Mich. (Pneumatic).
Mall Tool Co., Chicago.
Millers Falls Co., Greenfield, Mass.
Misener Mfg. Co., Inc., Syracuse, N. Y.
Paramount Products Co., New York City.
Signal Electric Mfg. Co., Menominee, Mich.
• Skilsaw, Inc., Chicago.
Snap-On Tools Corp., Kenosha, Wis.
Speedway Mfg. Co., Cicero, Ill.

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• Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
Van Dorn Electric Tool Co., Towson, Md.
Willy's Carbide Tool Co., Detroit.
• Wodack Electric Tool Corp., Chicago. (Combination Hammer and Drill)
York Electric and Machine Company, York, Pa.

DRIVE CLEATS

See Connectors, Metal, for Metal Ducts

DRIVES, STOKER

Butler Street Foundry & Iron Co., Chicago.
Davy Fuel & Supply Co., Stoker Div., Detroit.
Malco Gear Co., Dolton, Ill.
Merkle-Korff Gear Co., Chicago.
• Independent Pneumatic Tool Co., Chicago.
Stokerunit Corp., Milwaukee.

DUCT CONNECTIONS

See Connections, Duct, Flexible

DUCT INSULATION

See Insulation, Duct

DUCT TURNING VANES

See Vanes, Duct Turning

DUCTS AND DUCT FITTINGS, PREFABRICATED

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Adelta Manufacturing Co., Philadelphia.
Champion Furnace Pipe Co., Peoria, Ill.
Chandler Co., Cedar Rapids, Ia.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Gehri Co., Tacoma, Wash.
• General Heating Products Co., Minneapolis.
Gray Metal Products, Inc., Rochester, N. Y.
• Harvey-Whipple, Inc., Springfield, Mass.
• Henry Furnace Co., Medina, O.
Howes-Woods Co., Cambridge, Mass.
Huwer Heating Corp., Detroit.
• International Heater Co., Utica, N. Y.
Jacobs Co., B. & J., Cincinnati.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Moncrief Furnace Co., Atlanta, Ga.
• Mueller Furnace Co., L. J., Milwaukee.
Sioux Steel Co., Sioux Falls, S. D.
Schecter Brothers Co., Philadelphia.
Smith-Raymond Co., Columbus, Ga.
Superior Safety Furnace Pipe Co., Detroit.
Standard Furnace & Supply Co., Omaha, Nebr.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
• Williamson Heater Co., Cincinnati.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NOT METAL

American Ventilating Hose Co., New York City.
Campbell Engineering Co., Appleton, Wis. (Electric)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
DuPont de Nemours & Co., Inc., E. I., Wilmington, Del. (Rubberized tubing)
• Harvey-Whipple, Inc., Springfield, Mass.
• Sall-Mountain Co., Chicago.
United States Rubber Co., New York City.
Warner Bros. Co., Bridgeport, Conn.
Wiremold Company, Hartford, Conn. (Fabric)

DUST COLLECTORS

See Collectors, Dust

EAVES TROUGH FITTINGS AND ACCESSORIES

See Fittings and Accessories, Eaves Trough and Gutter

EAVES TROUGH AND GUTTERS

• American Rolling Mill Co., Middletown, O. (Stainless)
American Sheet Metal Works, New Orleans.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Bayonne Steel Products Co., Newark, N. J.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Bridesburg Foundry Co., Philadelphia.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh.
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Ledkote Products Co., Long Island City, N. Y.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee. (Square Hanging).
Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Northern Furnace & Supply Co., Billings, Mont.
Obdyke, Inc., B. P., Philadelphia.
Osborn Co., J. M. & L. A., Cleveland.
Overly Manufacturing Co., Greensburg, Pa.
Pittsburgh Plate Glass Co., Pittsburgh.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Ryniker Steel Products Co., Billings, Mont.
Saint Paul Corrugating Co., St. Paul, Minn.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Sioux Steel Co., Sioux Falls, S. D.
Southern States Iron Roofing Co., Savannah, Ga.
Standard Furnace & Supply Co., Omaha, Nebr.
Tiffin Art Metal Co., Tiffin, Ohio.
Van Noorden Co., E., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.
York Corrugating Co., York, Pa.

ELBOW MACHINES

See Machines, Elbow

ELBOWS, BLOW PIPE

See Fittings, Blow Pipe

ELBOWS, CONDUCTOR

See Fittings and Accessories, Conductor

ELBOWS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

ELECTRIC WELDERS

See Welders, Arc, Spot

ELECTRODES, ARC WELDING

Air Reduction Sales Co., New York City.
Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Allied Weld-Craft, Inc., Indianapolis.
Aluminum Co. of America, Pittsburgh.
American Agile Corporation, Cleveland.
• American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Arcos Corporation, Philadelphia.
Atlantic Steel Co., Atlanta, Ga.
Carlin Co., Anthony, Cleveland.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Chicago Steel & Wire Co., Chicago.
Electric Arc, Inc., Newark, N. J.
Electroloy Company, Inc., Chicago.
Eutectic Welding Alloys Co., New York City.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee.
Hobart Brothers Co., Troy, O.
Hollup Corp. Div., National Cylinder Gas Co., Chicago.
International Nickel Co., New York City.
Laclede Steel Co., St. Louis.
Lincoln Electric Co., Cleveland.
Marquette Mfg. Co., Inc., Minneapolis.
Maurath, Inc., Cleveland.
McKay Co., York, Pa.
Metal & Thermit Corp., New York City.
National Carbon Company, Inc., New York City.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Smith Corporation, A. O., Milwaukee.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Trindl Products, Ltd., Chicago.
Universal Power Corporation, Cleveland.
Welding Apparatus Co., Chicago.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Wilson Welder & Metals Co., Inc., New York City.

ENAMELS & LACQUERS

Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., Brooklyn. (Enamels)

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Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
Dragert Co., C. H., Inc., Brooklyn.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Ferro Enamel Corporation, Cleveland.
Glidden Co., The, Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Manufacturing Co., Des Moines, Ia.
Irvington Varnish & Insulator Co., Irvington, N. J.
Krehbiel Co., J. H., Chicago.
Maas & Waldstein Co., Newark, N. J.
O'Brien Varnish Co., South Bend, Ind.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Quigley Co., Inc., New York City.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City. (Enamels)
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland. (Enamel)
U. S. Gutta Percha Paint Co., Providence, R. I.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Wattenamel Co., Summit, Ill.
Wilbur & Williams, Boston, Mass.
Wilhelm Co., A., Reading, Pa.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

EXHAUSTERS, WELDING FUME

American Machine Products Co., Marshalltown, Ia.
Belanger Fan & Blower Co., Detroit.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Irvington, N. J.
Chicago Pneumatic Tool Co., New York City.
Coppus Engineering Corp., Worcester, Mass.
Day Co., Minneapolis.
Despatch Oven Co., Minneapolis.
Dynamic Air Engineering, Inc., Los Angeles.
General Blower Co., Morton Grove, Ill.
Kirk & Blum Mfg. Co., Cincinnati, O.
Klee Co., George B., Cincinnati.
Martin Fan & Blower Co., Chicago.
Ruemelin Mfg. Co., Milwaukee.
Sawyer Electrical Mfg. Co., Los Angeles.
Torit Manufacturing Co., St. Paul, Minn.
Utility Appliance Corporation, Los Angeles.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
• Whiting Corporation, Harvey, Ill.
Wind-Way Fan & Ventilator Co., Inc., New Orleans, La.

EXPANSION BOLTS

See Bolts, Expansion

FACES, COLD AIR, METAL

A-J Manufacturing Co., Kansas City, Mo.
• Air Control Products, Inc., Coopersville, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
• Auer Register Co., Cleveland.
Best Register Co., Milwaukee, Wis.
Controlair Manufacturing Co., Los Angeles.
Diamond Manufacturing Co., Wyoming, Pa.
Greenberg's Sons, M., San Francisco.
• Hart & Cooley Manufacturing Co., Holland, Mich.
Hendrick Manufacturing Co., Carbondale, Pa.
• Independent Register Co., Cleveland, O.
Mundt & Sons, Charles, Jersey City, N. J.
• Rock Island Register Co., Rock Island, Ill.
Schoedinger, F. O., Columbus, O.
Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.
Western Wire & Iron Works, Inc., Chicago.

FACES, COLD AIR, WOOD

Antigo Bldg. Supply Co., Antigo, Wis.
Eaglesfield Ventilator Co., Indianapolis.
Garber Lumber & Construction Co., Strasburgh, O.
Lockjoint Wood Products Co., Wichita, Kans.
Marsh Lumber Co., Inc., Dover, O.
McClure Builders' Supply Co., East Palestine, O.
• United States Register Co., Battle Creek, Mich.

FAN—FILTER UNITS, PROPELLER

(Separate conversion unit for warm air furnaces)

• Air Controls, Inc., Cleveland.
Meilish & Murray Co., Chicago.
Peerless Electric Co., Warren, O.
Utility Appliance Corporation, Los Angeles.
Wayne Automatic Relay Co., Fort Wayne, Ind.

FAN HOUSINGS

See Housings, Fan

FANS, AXIAL FLOW

Aerovent Fan Co., Piqua, O.
Ampex Electric & Mfg. Co., San Carlos, Calif.
Bahnson Co., Winston Salem, Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Buffalo Turbine Corp., Buffalo.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
LaDel Conveyor & Mfg. Co., New Philadelphia, O.
• Power Engineering Co., Chicago.
Propellair, Inc., Springfield, O.
South Bend Air Products Corp., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Wing Mfg. Co., L. J., New York City.

FANS, BOOSTER, COLD AIR RETURN

A-C Mfg. Co., Pontiac, Ill.
Advance Aluminum Castings Corp., Chicago.
• Air Conditioning Products Co., Detroit.
Aire-Foile Fan & Blower Co., Detroit.
Bern's Specialty Mfg. Co., Chicago.
Brumme Mfg. Co., Bloomington, Ill.
Buffalo Turbine Corp., Buffalo.
Cary Mfg. Co., Waupaca, Wis.
General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Martin Fan & Blower Co., Chicago.
Mauer Engineering, Evanston, Ill.
Midwestern Supply Co., Bloomington, Ill.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Roan Mfg. Co., Racine, Wis.
Semco Mfg. Co., Nashville, Tenn.
Universal Blower Co., Birmingham, Mich.
Utility Appliance Corporation, Los Angeles.

FANS, BOOSTER, ONE-PIPE WARM AIR

Advance Aluminum Castings Corp., Chicago.
• Air Conditioning Products Co., Detroit.
Aire-Foile Fan & Blower Co., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
Brumme Mfg. Co., Bloomington, Ill.
Buffalo Turbine Corp., Buffalo.
Dual-Air Fan Corporation, Chicago.
Martin Fan & Blower Co., Chicago, Ill.
Mauer Engineering, Evanston, Ill.
Midwestern Supply Co., Chicago.
• Mueller Furnace Co., L. J., Milwaukee.
Universal Blower Co., Birmingham, Mich.
Victor Electric Products, Inc., Cincinnati.

FANS, FURNACE, PROPELLER TYPE

(Complete with mounting for installation in cold air return)

• Air Controls, Inc., Cleveland.
Belanger Fan & Blower Co., Detroit.
Brumme Mfg. Co., Bloomington, Ill.
Century Fan & Ventilator Co., New York City.
Dual-Air Fan Corporation, Chicago.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Johnston Co., Wm. W., Dayton, O.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Meier Electric & Machine Co., Indianapolis.
Midwestern Supply Co., Bloomington, Ill.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Semco Mfg. Co., Nashville, Tenn.
Utility Appliances Corporation, Los Angeles.

FANS, KITCHEN EXHAUST

• Air Conditioning Products Co., Detroit.
Aire-Foile Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
Arex Co., Chicago.
Barrett Engineers, Cleveland Heights, O.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Bern's Specialty Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
• Clarage Fan Co., Kalamazoo, Mich.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Corp., Detroit.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Garden City Fan Co., Chicago.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.

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King Ventilating Co., Owantonna, Minn.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
Meyer Manufacturing Co., Detroit.
Myers Electric Co., Pittsburgh.
New York Blower Co., Chicago.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
• Pyrne & Co., Inc., Los Angeles, Calif.
Reynolds Electric Company, Chicago.
Roan Mfg. Co., Racine, Wis.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Schelm Brothers, Inc., East Peoria, Ill.
Semco Mfg. Co., Nashville, Tenn.
Shreveport Engineering Co., Inc., Shreveport, La.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe and Heater Co., Inc., St. Louis.
Smith Manufacturing Company, Inc., F. A., Rochester, N. Y.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, LaCrosse, Wis.
Universal Blower Co., Birmingham, Mich.
• U. S. Air Conditioning Corp., Minneapolis.
Victor Electric Products, Inc., Cincinnati.
Ward Mfg. Co., Plymouth, Mich.
West Wind Corporation, Seattle.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

FANS, NIGHT AIR COOLING, COMPLETE UNIT

• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., Cleveland.
Aire-Foile Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
• Alton Manufacturing Co., Dallas, Tex.
Allen Corporation, Detroit.
American Blower Corp, Detroit.
American Coolair Corp., Jacksonville, Fla.
American Metal Products Co., Fort Worth, Tex.
Associated Southern Industries, Memphis, Tenn.
Barrett Engineers, Cleveland Heights, O.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Bern's Specialty Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Earl Company, Warren, Houston, Tex.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Co., Chicago.
General Blower Co., Inc., Philadelphia.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Holden-Soules, Inc., Detroit.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
• Indiana Fan Co., Indianapolis, Ind.
International Engineering, Inc., Dayton, O.
• Jaden Manufacturing Co., Hastings, Nebr.
Jamieson Mfg. Co., Dallas, Tex.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
Kelley Mfg. Co., Houston, Tex.
King Ventilating Co., Owatonna, Minn.
• Lau Blower Co., Dayton, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
Meier Electric & Machine Co., Indianapolis.
Murray Co., Dallas, Tex.
• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Roto-Beam Div., Peerless of America, Chicago.
Schelm Brothers, Inc., East Peoria, Ill.
• Schwitzer-Cummins Co., Indianapolis.
Shreveport Engineering Co., Inc., Shreveport, La.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Universal Blower Co., Birmingham, Mich.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.
• Viking Air Conditioning Corp., Cleveland.
Ward Co., Edgar T., River Forest, Ill.
Western Blower Co., Seattle, Wash.
Wind-Way Fan & Ventilating Co., Inc., New Orleans.
• Wood Industries, Inc., Gar, Detroit.

FANS, VENTILATING, PROPELLER TYPE

(Capacity 4,000 c.f.m. up)

Aerovent Fan Co., Piqua, O.
• Air Controls, Inc., Cleveland.
Aire-Foile Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
Allen Corp., Detroit.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
Arex Co., Chicago.
Bahnson Co., Winston-Salem, N. C.
Barrett Engineers, Cleveland Heights, O.
• Bayley Blower Co., Milwaukee.
Beckett & Co., Thomas, Dallas, Tex.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Bern's Specialty Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
C. & H. Air Conditioning Fan Co., Inc., Atlanta, Ga.
Campbell Heating Company, E. K., Kansas City, Mo.
Century Fan & Ventilator Co., New York City.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
• Clarage Fan Co., Kalamazoo, Mich.
Coppus Engineering Corporation, Worcester, Mass.
Dallas Eng Co., Inc., Dallas, Tex.
De Bothezat Fans Division, American Machine & Metals, Inc., East Moline, Ill.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Duriron Co., Inc., Dayton, O. (Acid Resisting).
Dynamic Air Engineering, Inc., Los Angeles.
Earl Company, Warren, Houston, Tex.
Eclipse Air Brush Co., Inc., Newark, N. J.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Co., Chicago.
Garden City Fan Co., Chicago.
General Blower Co., Morton Grove, Ill.
Goettl Bros., Phoenix, Ariz.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Michigan.
Guth Company, Edwin F., St. Louis.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
Holden-Soules, Inc., Detroit.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
• Indiana Fan Co., Indianapolis, Ind.
International Engineering, Inc., Dayton, O.
Johnson Fan & Blower Corp, Chicago.
Johnston & Co., Wm. W., Dayton, O.
Jordan & Co., Paul R., Indianapolis.
Kelley Manufacturing Co., Houston, Texas.
King Ventilating Co., Owatonna, Minn.
Kisco Company, Inc., St. Louis.
Klee Co., George B., Cincinnati.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
• Lau Blower Co., Dayton, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Martin Fan & Blower Co., Chicago.
McCord Corporation, Detroit.
Meier Electric & Machine Co., Indianapolis.
Mountain States Equipment Co., Denver, Colo.
Myers Electric Co., Pittsburgh.
Naco Manufacturing Co., Huntington Park, Calif.
• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
• Palmer Manufacturing Corp, Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Perkins & Son., Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Company, Chicago.
Roto-Beam Div., Peerless of America, Inc., Chicago.
• Schwitzer-Cummins Co., Indianapolis.
Semco Mfg. Co., Nashville, Tenn.
Shreveport Engineering Co., Inc., Shreveport, La.
Signal Electric Mfg. Co., Menominee, Mich.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
South Bend Air Products, Inc., South Bend, Ind.
Steamaire Co., Cincinnati.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, La Crosse, Wis.
Trufio Fan Co., Harmony, Pa.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
Ward Co., Inc., Edgar T., River Forest, Ill.
Ward Mfg. Co., Plymouth, Mich.
Water Cooling Equipment Corp., St. Louis.
Western Blower Co., Seattle, Wash.

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Western Engineering & Mfg. Co., Los Angeles.
Wind-Way Fan & Ventilating Co., Inc., New Orleans.
Wing Mfg. Co., L. J., New York City.

FANS, WINDOW VENTILATING

• Air Conditioning Products Co., Detroit.
• Air Controls, Inc., Cleveland.
Airgard Manufacturing Co., Chicago.
Airmaster Corp., Chicago.
American Blower Corporation, Detroit.
American Coolair Corp., Jacksonville, Fla.
American Metal Products Co., Fort Worth, Tex.
Bern's Specialty Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York.
• Clarage Fan Co., Kalamazoo, Mich.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Company, Elizabethport, N. J.
Dual-Air Fan Corporation, Chicago.
Earl Company, Warren, Houston, Tex.
Electrovent Fan & Manufacturing Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Company, Chicago.
General Blower Co., Morton Grove, Ill.
General Blower Company, Inc., Philadelphia.
Goetti Bros., Phoenix, Ariz.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
• Indiana Fan Co., Indianapolis, Ind.
• Lau Blower Co., Dayton, O.
Meier Electric and Machine Co., Indianapolis.
National Engineering & Manufacturing Co., Kansas City.
• Nelson Corporation, Herman, Moline, Ill.
Peerless Electric Co., Warren, O.
Reed Unit-Fans, Inc., New Orleans, La.
Schelm Brothers, Inc., East Peoria, Ill.
• Schwitzer-Cummins Co., Indianapolis.
Semco Mfg. Co. Nashville, Tenn.
Shreveport Engineering Co., Inc., Shreveport, La.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Utility Appliance Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.
• Viking Air Conditioning Corporation, Cleveland.
Ward Co., Inc., Edgar T., River Forest, Ill.
Ward Mfg. Co., Plymouth, Mich.
Wind-Way Fan & Ventilator Co., Inc., New Orleans.

FASTENINGS, SPRING STEEL

Shakeproof, Inc., Chicago.
Tinnerman Products, Inc., Cleveland.

FILTERS, AIR, AUTOMATIC

Air Stream Filter Corp., St. Louis.
Air & Refrigeration Corp., New York City.
American Air Filter Co., Inc., Louisville, Ky.
• Brauer Supply Co., A. G., St. Louis.
Dollinger Corporation, Rochester, N. Y.
Dracco Corporation, Cleveland.
Farr Company, Los Angeles.
Westinghouse Electric Corp., Cleveland. (Electrostatic Precipitator)

FILTERS, AIR, UNIT, CLEANABLE

• Air Devices, Inc., New York City. (Steel wire mesh)
Air Filter Corporation, Milwaukee.
Air Filter Engineering Co., Chicago. (Galvanized wire cloth)
Air Maze Corp., Cleveland (Metal-Wire Baffles).
Air Stream Filter Corp., St. Louis.
American Air Filter Co., Inc., Louisville, Ky. (Steel wool)
• Badger Corporation, Milwaukee (Wire mesh)
• Brauer Supply Co., A. G., St. Louis.
Chicago Filter Co., Joliet, Ill.
Coppus Engineering Corp., Worcester, Mass. (Felt).
Dollinger Corporation, Rochester, N. Y. (Feltex, Glastex, heat resistant cotton).
Farr Company, Los Angeles (Metal Screen).
Filters, Incorporated, Glendale, Calif. (Felt).
Kauffman Air Conditioning Corp., St. Louis.
Kaye & McDonald, Inc., West Orange, N. J.
Kleenaire Corp., Stevens Point, Wis.
Morf Industries, Staten Island, N. Y. (Glass, wiremesh)
• Research Products Corporation, Madison, Wis. (Metal).
Somers, Inc., H. J., Detroit (Hair Glass).
Supreme Air Filter Co., New York City.
Universal Air Filter Corp., Duluth, Minn. (Cellulose).

FILTERS, AIR, UNIT, THROWAWAY

American Air Filter Co., Inc., Louisville, Ky.
• Badger Corporation, Milwaukee. (Glass)
Blocksom & Company, Michigan City, Ind. (Flame proof curled fibre and hair).
Chicago Filter Co., Joliet, Ill.
• Detroit Air Filter Co., Chicago. (Fibreboard)
Gehri Company, Tacoma, Wash. (Viscous).
Kleenaire Corp., Stevens Point, Wis.
Morf Industries, Staten Island, N. Y. (Glass, wire mesh)
Owens-Corning Fiberglas Corp., Toledo, O. (Fiberglas)
• Research Products Corp., Madison, Wis. (Expanded flame-proofed kraft fibre).
Sanit-Air Products Co., South Bend, Ind. (Register-steel wool)
Universal Air Filter Corp., Duluth, Minn. (Cellulose).
Wilson & Co., Inc., Chicago.

FIRE BRICK

See Refractories

FIREPOTS

See Repairs, Stove and Furnace

FIRING TOOLS

See Tools, Firing

FITTINGS AND ACCESSORIES, CONDUCTOR

(Elbows, Heads, Hooks, Shoes, Straps, etc.)

Allred Manufacturing Co., Inc., Indianapolis.
• American Rolling Mill Co., Middletown, O.
Ames Co., W. R., San Francisco.
Atchison Specialty Mfg. Co., Atchison, Kan. (Scuppers, drains)
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Boyd & Co., Inc., Charles P., Philadelphia.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Crary Mfg. Co., Middleport, O. (Cut-off).
Dieckmann Co., Ferdinand, Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Gray Metal Products, Inc., Rochester, N. Y.
• Hussey & Co., C. G., Pittsburgh.
Iwan Bros., South Bend, Ind.
Josam Manufacturing Co., Cleveland. (Drains and scuppers)
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
• Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Milwaukee.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
Obdyke, Inc., B. P., Philadelphia.
Osborn Co., J. M. & L. A., Cleveland.
Rattan Mfg. Co., New Haven, Conn.
Rival Strap Corp., New York City (Ornamental Conductor Straps).
Royal-Apex Mfg. Corp., Brooklyn.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Stewart Foundry, O. S., Cleveland (Iron Conductor Shoes).
Tiffin Art Metal Co., Tiffin, Ohio.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.

FITTINGS AND ACCESSORIES, EAVES TROUGH AND GUTTER

(Hangers, Strainers, Miters, Ends, Thimbles, etc.)

Abbott Mfg. Co., Painesville, O. (Hangers).
American Sheet Metal Works, New Orleans, La. (Straps)
Ames Co., W. R., San Francisco.
Audubon Wire Cloth Corp., Philadelphia (Strainers).
Barnes Metal Products Co., Chicago.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Bertram Mfg. Co., Chicago.
Blake Manufacturing Co., Rock Island, Ill. (Drains)
Boyd & Co., Inc., Charles P., Philadelphia.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Eav-Tex Company, Upper Darby, Pa. (Roof Gutter Protection).
Edwards Mfg. Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Grand Rapids Wire Products Co., Grand Rapids, Mich.
Gray Metal Products, Inc., Rochester, N. Y.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh (Copper).
Iwan Brothers, South Bend, Ind.
Juniper Elbow Company, Inc., Middle Village, L. I., N. Y.
Klauer Mfg. Co., Dubuque, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y. (Eaves trough, hangers, miters)
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Ledkote Products Co., Long Island City, N. Y.
• Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
New Way Products Company, Toledo (Eaves Trough Shield).
Obdyke, Inc., B. P., Philadedlphia.

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Ohio Wire Products Co., Dover, O. (Hangers).
Osborn Co., J. M. & L. A., Cleveland.
Reeves Steel & Mfg. Co., Dover, O.
Royal-Apex Mfg. Corp., Brooklyn.
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Snap-On Mfg. Co., Chicago (Hangers).
Southern States Iron Roofing Co., Savannah, Ga.
Tiffin Art Metal Co., Tiffin, Ohio.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio. (Clamp)
U. S. Cistern Filter Mfg. Co., Bloomington, Ill.
Wade Manufacturing Co., Elgin, Ill. (Roof Drains).
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.

FITTINGS AND ACCESSORIES, FURNACE PIPE

(Angles, Boots, Elbows, Heads, Joints, Offsets, Tees etc.)

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Adelta Manufacturing Co., Philadelphia.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Company, Columbus, Ohio.
Bergstrom Mfg. Corp., Neenah, Wis.
Bieler & Son, Long Island City. (Adjustable elbows)
Braden Mfg. Co., Terra Haute, Ind.
Cary Mfg. Co., Waupaca, Wis.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farquhar Furnace Co., Wilmington, O.
Fraser & Johnston Co., San Francisco.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines, Ia.
• Henry Furnace Company, Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Howe & Bassett Co., Inc., Rochester, N. Y. (Boots).
Howes-Woods Company, Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Juniper Elbow Company, Inc., Middle Village, L. I., N. Y.
Keith Furnace Company, Des Moines, Iowa.
• Krauser-Boyd, Inc., North Tonawanda, N. Y. (Elbows).
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis. (Elbows and pipe only).
Lennox Furnace Co., Marshalltown, Ia.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Monarch Furnace Fittings Manufacturers, Chicago.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
Osborn Co., J. M. & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
• Payne Furnace Co., Beverly Hills, Calif.
• Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Company, Dowagiac, Mich.
Reeves Steel & Mfg. Co., Dover, O.
• Rock Island Register Co., Rock Island, Ill.
Ryniker Steel Products Co., Billings, Mont.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Specialty Co., Pittsburgh.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
Superior Products Co., Omaha, Nebr.
Tiffin Art Metal Co., Tiffin, Ohio.
Tri-State Heating Supply Company, Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williamson Heater Co., Cincinnati.

FITTINGS AND ACCESSORIES, OIL BURNERS

Commercial Filters Corp., Boston. (Fuel oil filters)
• Delavan Engineering Co., Des Moines, Ia. (Nozzles)
• Krueger Sentry Gauge Co., Green Bay, Wis. (Liquid level gauge)

FITTINGS AND ACCESSORIES, SMOKE PIPE

(Draw-bands, Clean-outs, Collars, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Company, Columbus, Ohio.
Bardes Range & Foundry Co., E. H., Cincinnati.
Bergstrom Mfg. Corp., Neenah, Wis.
Bieler & Son, L., Long Island City, N. Y.
Braden Mfg. Co., Terre Haute, Ind.
• Brauer Supply Co., A. G., St. Louis.
Cary Mfg. Co., Waupaca, Wis.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Heights Furnace Supply Co., Chicago Heights, Ill.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines, Ia.
• Henry Furnace Company, Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Homer Furnace & Foundry Corporation, Coldwater, Mich.
Howes-Woods Company, Cambridge, Mass.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Juniper Elbow Company, Inc., Middle Village, L. I., N. Y.
Keith Furnace Company, Des Moines, Ia.
Kirk & Blum Mfg. Co., Cincinnati.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fieberger Company, Newark, Ohio.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Osborn Co., J. M. & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
• Patten Co., J. V., Sycamore, Ill.
Peacard Co., M. A., Boston.
• Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Company, Dowagiac, Mich.
Reeves Steel & Mfg. Co., Dover, O.
• Rock Island Register Co., Rock Island, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
Superior Products Co., Omaha, Nebr.
Tierney Rotor Ventilator Co., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Tri-State Heating Supply Company, Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
Wilder Manufacturing Co., Niles, O.
• Williamson Heater Co., Cincinnati.

FITTINGS, BLOW PIPE

(Elbows, Flanges, Hangers, Hoods and Sweeps, Joints, Rings, Tubing)

Allington & Curtis Mfg. Co., Saginaw, Mich.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Day Co., Minneapolis.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
Kirk & Blum Mfg. Co., Cincinnati (Adjustable Buffing Hoods).
Mahon Co., R. C., Detroit.
• National Metal Fabricators, Chicago.
Northern Blower Co., Cleveland.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Schmieg Industries, Detroit.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Sleeth & Son, J. E., Spokane, Wash.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee.
Young & Bertke Co., Cincinnati.

FITTINGS, COPPER TUBE, COMPRESSION AND FLARED

• American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Commonwealth Brass Corp., Detroit.

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Conklin Brass & Copper Co., Inc., T. E., New York City.
Crane Co., Chicago.
Everhot Products Co., Chicago.
Grinnell Co., Inc., Providence, R. I.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago.
Kerotest Mfg. Co., Pittsburgh.
Northern Indiana Brass Co., Elkhart, Ind.
Packless Metal Products Corp., New Rochelle, N. Y.
Parker Appliance Co., Cleveland.

FITTINGS, HUMIDIFIER, WATER LINE

• American Brass Co., Waterbury, Conn.
Beckett & Co., Thomas, Dallas, Tex.
Hays Mfg. Co., Erie, Pa.
• McDonnell & Miller, Chicago.
• Maid-O'-Mist, Inc., Chicago.
Mueller Brass Co., Port Huron, Mich.
Parker Appliance Co., Cleveland.
Reichert Float & Mfg. Co., Toledo, O.
• Skuttle Manufacturing Co., Detroit.
Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron, Mich.

FLANGERS

See Machines, Flanging

FLANGES, BLOW PIPE

See Fittings, Blow Pipe

FLASHINGS, ROOF, PATENTED

Alpha Metals, Inc., Brooklyn.
• American Rolling Mill Co., Middletown, Ohio (Galvanized).
Barrett Division, Allied Chemical & Die Corporation, New York City (for brick and concrete).
Berger Mfg. Div. Republic Steel Co., Canton, Ohio.
Biersach & Niedermeyer Co., Milwaukee.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cheney Metal Products Co., Trenton, N. J.
Copper Roofs Corporation, Milwaukee.
Cox Roofing Co., Winston-Salem, N. C.
Downs-Smith Brass & Copper Co., New York City.
Eagle-Picher Co., Cincinnati.
Edwards Mfg. Co., Inc., Cincinnati.
Figge Mfg. Co., Chicago.
Flemm Lead Company, Inc., Long Island City, N. Y.
• Hussey & Co., C. G., Pittsburgh.
Keystone Flashing Company, Philadelphia.
Majestic Flashing Company, Baltimore.
• Milcor Steel Co., Milwaukee.
National Lead Company, New York City.
New Delphos Manufacturing Co., Delphos, Ohio.
Robertson Co., H. H., Pittsburgh.
Rochester Lead Works, Inc., Rochester, N. Y.
Schoedinger, F. O., Columbus, O.
Simplex Manufacturing Co., Fond du Lac, Wis.
Sisalkraft Co., Chicago.
Van Noorden Co., E., Boston.
• Williams-Wallace Co., San Francisco.
York Corrugating Co., York, Pa.

FLASHINGS, THROUGH-WALL, PATENTED

• American Brass Co., Waterbury, Conn. (Copper).
Biersach & Niedermeyer Company, Milwaukee.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cheney Metal Products Co., Trenton, N. J.
Downs-Smith Brass & Copper Co., Inc., New York City.
Figge Mfg. Co., Chicago.
Keystone Flashing Company, Philadelphia.
Majestic Flashing Company, Baltimore.
New Delphos Manufacturing Co., Delphos, Ohio.
Robertson Co., H. H., Pittsburgh.
ThruBond Flashing Corp., New York City.
Van Noorden Co., E., Boston.

FLASHINGS, WALL, PATENTED

Biersach & Niedermeyer Company, Milwaukee.
• Cheney Metal Products Co., Trenton, N. J. (Aluminum)
Copper Roofs Corporation, Milwaukee.
Figge Mfg. Co., Chicago.
Keystone Flashing Company, Philadelphia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Majestic Flashing Company, Baltimore.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
Schoedinger, F. O., Columbus, O.
Sisalkraft Co., Chicago.
ThruBond Flashing Corp., New York City.
Van Noorden Co., E., Boston.
York Corrugating Co., York, Pa.

FLOOR FURNACES

See Furnaces, Warm Air, Floor

FLUE GAS ANALYZERS

See Analyzers, CO_2, Portable

FLUX, SOLDERING

Air Reduction Sales Company, New York City (Aluminum).
• Allen Co., Inc., L. B., Chicago (Aluminum, Copper, Gal. Iron, Stainless Steel).
American Chemical Paint Co., Ambler, Pa.
American Solder & Flux Co., Philadelphia, Pa.
Bastian-Blessing Co., Chicago.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Benson Co., Inc., Alex R., Hudson, N. Y. (Salts, Pastes for Copper, Galvanized, Stainless).
Burnley Battery & Mfg. Co., North East, Pa. (Paste, Salts, Solution), (Copper, Galvanized Iron).
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Copper sweat fittings).
Diener Mfg. Co., Geo. W., Chicago.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Copper, Galvanized Iron).
Eutectic Welding Alloys Co., New York City (Aluminum, Copper, Galvanized Iron, Stainless).
Farrelloy Company, Inc., Philadelphia.
Garden City Laboratory, Inc., Chicago.
Gardiner Metal Co., Chicago.
General Electric Co., Bridgeport, Conn.
Glaser Lead Co., Inc., Brooklyn. (Every purpose)
Handy & Harman, New York City (Copper, galvanized iron, stainless).
Hercules Chemical Co., Inc., New York City.
• Johnson Co., Lloyd S., Chicago (Aluminum, stainless steel, copper, galvanized iron).
• Johnson Gas Appliance Co., Cedar Rapids, Iowa.
Kester Solder Co., Chicago (Viscosiformed Paste, Trichloron Salts, Stainless Steel—Paste and Salts).
• Langsenkamp Co., F. H., Indianapolis. (Stainless steel)
Lewis Laboratories, Inc., Paul, Milwaukee (Low Tin Content).
Linde Air Products Co., New York City (Aluminum, copper, galv. iron, stainless).
• Lukens Metal Co., Thos. F., Philadelphia. (Copper, Galvanized Iron, Stainless Steel).
Motex Metal Process Corporation, Detroit.
National Cylinder Gas Co., Chicago.
Neilson Chemical Co., Detroit (For Steel).
Pfanstiehl Chemical Co., Waukegan, Ill. (Copper, galv. iron, stainless).
Potomac Mfg. Co., Philadelphia.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
• Ruby Chemical Co., Columbus, O. (Liquid and Paste for copper, galv. iron, stainless).
Scaife Company, Oakmont, Pa.
Superior Flux Co., Cleveland. (Aluminum, copper, iron, magnesium, stainless).
Technical Processes Div., Colonial Alloys Co., Philadelphia.
Torchweld Equipment Div. National Cylinder Gas Co., Chicago (Aluminum, copper, galv. iron, stainless).
Turco Products, Inc., Los Angeles.
Universal Power Corpration, Cleveland.
Wolfe-Kote Co., Sheboygan, Wis.
Woodhill Chemical Co., Cleveland.

FRAMING, FOR HOUSING ASSEMBLIES

Dahlstrom Metallic Door Co., Jamestown, N. Y.
Overly Manufacturing Co., Greensburg, Pa.

FUEL OIL FILTERS

See Fittings and Accessories, Oil Burner

FUEL UNITS FOR OIL BURNERS

See Units, Fuel, for Oil Burners

FURNACE BLOWERS

See Blowers, Furnace, Centrifugal

FURNACE-BURNER UNITS

See Furnaces, Warm Air

FURNACE CEMENT

See Cement, Furnace

FURNACE CLEANERS

See Cleaners, Vacuum, Furnace

FURNACE COVERING

See Insulation, Furnace and Pipe

FURNACE LIGHTERS

See Lighters, Furnace

FURNACE LINING

See Refractories

FURNACE PIPE

See Pipe, Furnace

FURNACE PIPE FITTINGS AND ACCESSORIES

See Fittings and Accessories, Furnace Pipe

FURNACE REGULATORS

See Regulators, Furnace Draft, Mechanical and Motors, Damper, Furnace Draft, Electrical

FURNACE REPAIRS

See Repairs, Stove and Furnace

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FURNACES FOR LARGE BUILDINGS

(800,000 Btu and up)

• Airtherm Manufacturing Co., St. Louis.
• American Furnace Co., St. Louis.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago (Gas or Oil).
Dravo Corporation, Pittsburgh.
• Hall-Neal Furnace Co., Indianapolis, Ind.
International Sales Co., San Francisco.
• Jackson & Church Co., Saginaw, Mich.
Lee Engineering Co., Youngstown, Ohio.
Lennox Furnace Co., Marshalltown, Iowa.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
• Mueller Furnace Company, L. J., Milwaukee.
National Heater Co., Minneapolis.
Northwest Foundry & Furnace Works, Inc., Portland, Ore.
• Peerless Foundry Co., Inc., Indianapolis.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.

FURNACES, SOLDERING

Acme Electric Heating Co., Inc., Boston.
Aeroil Products Co., West New York, N. J.
Bernz Co., Otto, Rochester, N. Y.
Burgess Soldering Furnace Co., Columbus, O. (Gasoline).
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hones, Inc., Charles A., Baldwin, N. Y. (Gas.)
• Johnson Gas Appliance Co., Cedar Rapids, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Liquefied Gas Appliance Co., Mars, Pa.
Mutual Liquid Gas & Equipment Co., Inglewood, Calif.
• Peck, Stow & Wilcox Co., Southington, Conn.
Pennsylvania Furnace & Iron Co., Warren, Pa.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Cedar Rapids, Ia.
Sanders, J. A., Fulton, N. Y.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago. (Gasoline, kerosene)
Vulcan Electric Co., Danvers, Mass.
Wall Mfg. Supply Co., P., N. S. Pittsburgh.
Ward Machinery Co., Chicago (Gas).
Weiss & Co., H., New York City.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

FURNACES, WARM AIR, AIR CONDITIONING COAL, CAST IRON

(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Agricola Furnace Co., Inc., Gadsden, Ala.
• Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
American Radiator and Standard Sanitary Corp., Pittsburgh
Andes Range & Furnace Corp., Geneva, N. Y.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Company, Springfield, Ill.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hart & Crouse Corp., Utica, N. Y.
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
• International Heater Co., Utica, N. Y.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Kehm Corporation, Chicago.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Mfg. Co., C. A., Elyria, O.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Sioux City Foundry & Boiler Company, Sioux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Twentieth Century Heating & Ventilating Co., Akron, O.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, AIR CONDITIONING, COAL, STEEL

(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Airwasher Corporation, Lansing, Mich.
• Airtemp Div., Chrysler Corp., Dayton, O.
• American Furnace Co., St. Louis.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Deshler Foundry & Machine Works, Deshler, Ohio.
• Dowagiac Steel Furnace Company, Dowagiac, Mich.
Excelsior Steel Furnace Co., Chicago.
Farquhar Furnace Co., Wilmington, O.
• Fitzgibbons Boiler Company, Inc., New York City.
Floral City Co., Monroe, Mich.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Company, Div. Liberty Foundry Co., St. Louis.
• Furbio Company, Hermansville, Mich.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Heatlox Furnaces, Inc., Tacoma, Wash.
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
• Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago.
• International Heater Co., Utica, N. Y.
• Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
Koons Furnace Co., Danville, Ill.
• Leader Iron Works, Inc., Decatur, Ill.
Leeson Air Conditioning Corp., Detroit.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace & Supply Co., Portland, Ore. (Also sawdust and wood burning).
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
Northwest Foundry & Furnace Works, Portland, Ore.
• Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Perfection Stove Co., Inc., Cleveland.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Smith Heater Co., Peter, Detroit.
Spencer Heater Division, Williamsport, Pa.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Sure Comfort Furnace Co., Forest Park, Ill.
• Syncromatic Corporation, Milwaukee.
United States Radiator Corporation, Detroit.
• Viking Manufacturing Corporation, Cleveland
• Waterman-Waterbury Co., Minneapolis.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, AIR CONDITIONING, FOR ATTIC INSTALLATION, STEEL

• American Furnace Co., St. Louis. (Oil or gas)
International Sales Co., San Francisco. (Gas).
Lennox Furnace Co., Marshalltown, Iowa (Gas).
• Payne Furnace Co., Beverly Hills, Calif. (Gas)

FURNACES, WARM AIR, AIR CONDITIONING, GAS, CAST IRON

(Complete matched, gas-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

• Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Company, St. Louis.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Company, Minneapolis.
Bastian-Morley Co., Inc., LaPorte, Ind.
Beck Engineering Combustion Kompany, St. Louis.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Coroaire Heater Corporation, Cleveland.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
• Forest City Foundries Co., Cleveland, O.
• General Electric Co., Bloomfield, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.
• International Heater Co., Utica, N. Y.
Moncrief Furnace & Mfg. Co., Dallas, Texas.
• Mueller Furnace Co., L. J., Milwaukee.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
• Olsen Manufacturing Co., C. A., Elyria, O.
Pennsylvania Furnace & Iron Co., Warren, Pa.
• Premier Furnace Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
• Schwab Furnace Co., Milwaukee.
Security Manufacturing Co., Kansas City, Mo.
Sioux City Foundry and Boiler Company, Sioux City, Ia.
• Surface Combustion, Toledo, O.
Thatcher Furnace Co., Garwood, N. J.
Twentieth Century Heating & Ventilating Co., Akron, O.
• Viking Mfg. Corp., Cleveland.
XXth Century Heating & Ventilating Co., Akron, O.
• Williamson Heater Co., Cincinnati, O.
• Wise Furnace Co., Akron, O.
• Wood Industries, Inc., Gar, Detroit.

FURNACES, WARM AIR, AIR CONDITIONING, GAS, STEEL

(Complete matched, gas-fired furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
• Airtemp Div., Chrysler Corp., Dayton, O.
Aladdin Heating Corporation, Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
American Furnace Company, St. Louis.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Company, Minneapolis.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Brown Steel Tank Co., Minneapolis.
Bryant Corp., C. L., Cleveland.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Campbell Heating Company, Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Chandler Company, Cedar Rapids, Ia.
• Conco Engineering Works, Mendota, Ill.
Dalzen Tool & Manufacturing Co., Detroit.
Dornback Furnace & Foundry Co., Cleveland.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Fitzgibbons Boiler Co., Inc., New York City.
Floral City Company, Monroe, Mich.
• Forest City Foundries Co., Cleveland.
Fraser and Johnston Co., San Francisco.
Gaul Air Conditioner Co., Dayton, Ohio.
General Gas Light Co., Kalamazoo, Mich.
Gillen Company, J. L., Dowagiac, Mich.
Glasby Manufacturing Co., Inc., J. P., Belleville, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hammel Radiator Engineering Co., Los Angeles, Cal.
Heating Equipment Co., San Francisco.
Heil Co., The, Milwaukee.
• Henry Furnace Company, Medina, Ohio.
Hess Warming & Ventilating Co., Chicago.
• Holly Heating & Mfg. Co., Pasadena, Calif.
Huwer Heating Corp., Detroit.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
International Sales Co., San Francisco.
• Jackson & Church Co., Saginaw, Mich.
Johnston Gas Furnace Corp., North Hollywood, Calif.
Joliet Heating Corp., Joliet, Ill.
Kaustine Company, Inc., Perry, N. Y.
Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kent & Co., Inc., J. King, St. Louis.
Koons Furnace Company, Danville, Ill.
Leeson Air Conditioning Corporation, Detroit.
Lennox Furnace Co., Marshalltown, Ia.
• Majestic Co., Huntington, Ind.
• May-Fiebeger Co., Newark, O.
• Mayflower Air-Conditioners, Inc., St. Paul, Minn.
• Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace & Mfg. Co., Inc., Dallas, Texas.
• Morrison Steel Products, Inc., Buffalo.
• Mueller Furnace Co., L. J., Milwaukee.
Naco Manufacturing Co., Huntington Park, Calif.
New Mission Htg. & Vent. Co., San Francisco.
Northern Furnace & Supply Co., Billings, Mont.
• Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
• Patten Co., J. V., Sycamore, Ill.
• Payne Furnace Co., Beverly Hills, Calif.
Pennsylvania Furnace & Iron Co., Warren, Pa.
• Perfection Stove Co., Cleveland.
Pernot & Rich, Inc., Los Angeles.
• Premier Furnace Company, Dowagiac, Mich.
Reif-Rexoll, Inc., Buffalo.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equipment Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
Ryniker Steel Products Company, Billings, Mont.
St. Louis Furnace Manufacturing Co., St. Louis.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Scott-Newcomb, Inc., St. Louis.
Security Manufacturing Co., Kansas City, Mo.
• Syncromatic Corporation, Milwaukee.
United States Radiator Corp., Detroit.
Utility Appliance Corporation, Los Angeles. (Butane)
• Viking Mfg. Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Wayne Oil Burner Co., Fort Wayne, Ind.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, AIR CONDITIONING, OIL, CAST IRON

(Complete matched, oil-burning furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
American Foundry & Furnace Co., Bloomington, Ill.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Auto-Heat Corporation, New York City.
Chandler Co., Cedar Rapids, Ia.
Coroaire Heater Corporation, Cleveland.
Excelsior Steel Furnace Co., Chicago.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Mueller Furnace Co., L. J., Milwaukee.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, Ohio.
• Schwab Furnace Co., Milwaukee.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Westwick & Son, Inc., John, Galena, Ill.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
• Wise Furnace Co., Akron, O.

FURNACES, WARM AIR, AIR CONDITIONING, OIL, STEEL

(Complete matched, stoker-furnace, fan, filter, and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Airwasher Corporation, Lansing, Mich.
• Airtemp Div., Chrysler Corp., Dayton, O.
American Air Conditioning Corp., Sebastopol, Calif.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
American Stove Co., Lorain, O.
• Anchor Post Fence Co., Heating Div., Baltimore.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Auto-Heat Corporation, New York City.
Automatic Burner Corporation, Chicago.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustian Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Brown Steel Tank Co., Minneapolis.
Bryant Corp., C. L., Cleveland.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Cary Manufacturing Co., Waupaca, Wis.
• Century Engineering Corporation, Cedar Rapids, Ia.
Chandler Co., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
• Conco Engineering Corp., Mendota, Ill.

• Advertisement in this issue. See Index to Advertisers, pages 847-849.

Crane Company, Chicago.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Demuth & Sons, Charles, Minneola, L. I.
Deshler Foundry & Machine Works, Deshler, O.
• Des Moines Stove Repair Co., Des Moines, Ia.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Electrol Mfg. Co., Passaic, N. J.
Farquhar Furnace Co., Wilmington, O.
• Fitzgibbons Boiler Co., Inc., New York City.
Floral City Co., Monroe, Mich.
• Forest City Foundries Co., Cleveland, O.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Furbio Company, Hermansville, Mich.
Gasoroil Mfg. Corp., Genoa City, Wis.
Gehri Co., Tacoma, Wash.
• General Electric Co., Bloomfield, N. J.
• General Heating Products Co., Minneapolis.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gillen Co., J. L., Dowagiac, Mich.
Glasby Manufacturing Co., Inc., J. P., Belleville, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
• Heil Co., Milwaukee.
Harvey-Whipple, Inc., Springfield, Mass.
Heatlox Furnaces, Inc., Tacoma, Wash.
Heil Co., Milwaukee.
• Henry Furnace Co., Medina, O.
• Hess Warming & Ventilating Co., Chicago.
Hipoint Corp., Bellefontaine, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Hotentot Co., Inc., Omaha, Nebr.
Huwer Heating Corp., Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
• International Heater Co., Utica, N. Y.
International Sales Co., San Francisco.
Interstate Metal Products Co., Inc., Chicago.
Iron Fireman Manufacturing Co., Cleveland.
• Jackson & Church Co., Saginaw, Mich.
• Jennings, Freeland L., Lima, O. (With integral domestic water heating unit)
Joliet Heating Corp., Joliet, Ill.
Johnson Co., S. T., Oakland, Calif., and Philadelphia.
Kaustine Company, Inc., Perry, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
Kleen-Heet, Inc., Chicago.
Koons Furnace Co., Danville, Ill.
• Kresky Mfg. Co., Petaluma, Calif.
Kruse Co., Indianapolis, Ind.
Laco Oil Burner Co., Griswold, Ia.
Leeson Air Conditioning Corp., Detroit.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
Lochinvar Products Div. Michigan Tank & Furnace Corp., Detroit.
McPherson Furnace & Supply Co., Portland, Ore.
• Majestic Co., Huntington, Ind.
• May-Fiebeger Co., Newark, O.
• Mayflower Air-Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Morrison Steel Products, Inc., Buffalo.
• Mueller Furnace Co., L. J., Milwaukee.
Nelson Company, Detroit.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Works, Portland, Ore.
• Nu-Way Corp., Rock Island, Ill.
• Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Patten Co., J. V., Sycamore, Ill.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
• Perfection Stove Co., Cleveland.
• Petroleum Heat & Power Co., Stamford, Conn.
Quaker Mfg. Co., Chicago.
• Quincy Stove Manufacturing Co., Quincy, Ill.
• Radiation Furnace Corp., Benton Harbor, Mich.
Ray Oil Burner Co., San Francisco.
Reif-Rexoil, Inc., Buffalo.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
• Schwab Furnace Co., Milwaukee.
Scott-Newcomb, Inc., St. Louis.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Skinner Htg. & Vent. Co., Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Sundstrand Engineering Co., Rockford, Ill.
Sure Comfort Furnace Co., Forest Park, Ill.
Syncro-Flame Burner Corp., Brockton, Mass.
• Syncromatic Corporation, Milwaukee.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corp., Detroit.
• Viking Mfg. Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Wayne Oil Burner Co., Fort Wayne, Ind.
Weatherall Engineers, Inc., Providence, R. I.
Western Blower Co., Seattle, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
• Williamson Heater Co., Cincinnati.
• Wood Industries, Inc., Gar, Detroit.
York-Heat Div., York-Shipley, Inc., York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING, STOKER, CAST IRON

(Complete matched, stoker-furnace, fan, filter, and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
American Foundry & Furnace Co., Bloomington, Ill.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Stove & Mfg. Co., Quincy, Ill.
• Forest City Foundries Co., Cleveland, O.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
• Schwab Furnace Co., Milwaukee.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, AIR CONDITIONING, STOKER, STEEL

(Complete matched, stoker-furnace, fan, filter, and humidfier)

Airwasher Corporation, Lansing, Mich.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Anchor Stove & Range Co., New Albany, Ind.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Chandler Co., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago.
• Conco Engineering Works, Mendota, Ill.
Deshler Foundry & Machine Works, Deshler, O.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Farquhar Furnace Co., Wilmington, O.
• Fitzgibbons Boiler Co., Inc., New York City.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis
• Furbio Company, Hermansville, Mich.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Heatlox Furnaces, Inc., Tacoma, Wash.
• Hess Warming & Ventilating Co., Chicago.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Iron Fireman Manufacturing Co., Cleveland.
• Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Kol-Master Corporation, Oregon, Ill.
Koons Furnace Co., Danville, Ill.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace & Supply Co., Portland, Ore.
• Majestic Company, Huntington, Ind.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Nelson Company, Detroit.
Northwest Foundry & Furnace Works, Portland, Ore.
• Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
• Premier Furnace Co., Dowagiac, Mich.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
• Schwab Furnace Co., Milwaukee.
•Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
• Stok-A-Fire Co., Inc., University City, Mo.
Sun-Fire Stoker Corporation, New Albany, Ind.
Sure Comfort Furnace Co., Forest Park, Ill.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

• Syncromatic Corporation, Milwaukee.
• Waterman-Waterbury Co., Minneapolis.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, COAL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

• Airtemp Div., Chrysler Corp., Dayton, O.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
• Fitzgibbons Boiler Co., Inc., New York City.
Floral City Co., Monroe, Mich.
• Hall-Neal Furnace Co., Indianapolis, Ind.
• Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corporation, Joliet, Ill.
Kehm Corporation, Chicago.
Lennox Furnace Co., Marshalltown, Ia.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
• Peerless Foundry Co., Inc., Indianapolis, Ind.
Smith Heater Co., Peter, Detroit.
• Syncromatic Corporation, Milwaukee.
• Viking Manufacturing Corporation, Cleveland.
• Williamson Heater Co., Cincinnati. (Cast Iron)

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, CAST IRON

(Complete matched furnace with burner, fan, filter, humidifier)

• Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
• Forest City Foundries Co., Cleveland.
• General Electric Co., Bloomfield, N. J.
• Hall-Neal Furnace Co., Indianapolis, Ind.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Manufacturing Co., C. A., Elyria, O.
Richmond Radiator Co., New York City.
• Surface Combustion, Toledo.
• Viking Mfg. Corp., Cleveland.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

• Airtemp Div., Chrysler Corporation, Dayton, O.
Aladdin Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Company, Auburn, Ind.
Bard Manufacturing Co., Bryan, O.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Coleman Company, Inc., Wichita, Kans.
• Conco Engineering Works, Mendota, Ill.
Dalzen Tool & Manufacturing Co., Detroit.
Evanoil Div., Evans Products Co., Detroit.
• Forest City Foundries Co., Cleveland.
Fraser & Johnston Co., San Francisco.
General Gas Light Co., Kalamazoo, Mich.
Gibraltar Engineering Co., Los Angeles.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hammel Radiator Engineering Co., Los Angeles.
Heating Equipment Co., San Francisco.
Huwer Heating Corp., Detroit.
Ideal Furnace Co., Detroit.
• Jackson & Church Co., Saginaw, Mich.
Kehm Corporation, Chicago.
Kent & Co., Inc., J. King, St. Louis.
Leeson Air Conditioning Corporation, Detroit.
Lennox Furnace Co., Marshalltown, Ia.
• Majestic Co., Huntington, Ind.
• May-Fiebeger Company, Newark, O.
• Mayflower Air Conditioners, Inc., St. Paul, Minn.
• Meyer Furnace Co., Peoria, Ill.
• Morrison Steel Products, Inc., Buffalo, N. Y.
• Mueller Furnace Co., L. J., Milwaukee.
Naco Manufacturing Co., Huntington Park, Calif.
• Olsen Manufacturing Co., C. A., Elyria, O.
• Palmer Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
• Patten Co., J. V., Sycamore, Ill.
• Payne Furnace Co., Beverly Hills, Calif.
• Perfection Stove Co., Cleveland.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
• Viking Mfg. Corp., Cleveland.
• Wood Industries, Inc., Gar, Detroit.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, OIL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

• Airtemp Div., Chrysler Corporation, Dayton, O.
• American Furnace Co., St. Louis.
American Stove Co., Lorain Div., Lorain, O.
• Anchor Post Fence Co., Heating Div., Baltimore.
Auburn Burner Co., Auburn, Ind.
Bard Manufacturing Co., Bryan, O.
Cary Manufacturing Co., Waupaca, Wis.
Coleman Company, Inc., Wichita, Kans.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Evanoil Div., Evans Products Co., Detroit.
Gasoroil Mfg. Corp., Genoa City, Wis.
• General Electric Co., Bloomfield, N. J.
• Hall-Neal Furnace Co., Indianapolis, Ind.
• Harvey-Whipple, Inc., Springfield, Mass.
Huwer Heating Corp., Detroit.
Ideal Furnace Co., Detroit.
Interstate Metal Products Co., Inc., Chicago.
• Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corporation, Joliet, Ill.
• Kresky Mfg. Co., Petaluma, Calif.
Kruse Company, Indianapolis.
Leeson Air Conditioning Corp., Detroit.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
McPherson Furnace & Supply Co., Portland, Ore.
• Majestic Co., Huntington, Ind.
• May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
• Morrison Steel Products, Inc., Buffalo.
• Mueller Furnace Co., L. J., Milwaukee.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Works, Portland, Ore.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
• Patten Co., J. V., Sycamore, Ill.
• Perfection Stove Co., Cleveland.
• Premier Furnace Co., Dowagiac, Mich.
Quaker Mfg. Co., Chicago.
• Quincy Stove Manufacturing Co., Quincy, Ill.
Sandberg Co., H. J., Portland, Ore.
Silent Sioux Oil Burner Corp., Orange City, Ia.
• Syncromatic Corporation, Milwaukee.
• Viking Manufacturing Corp., Cleveland.
Weatherall Engineers, Inc., Providence, R. I.
• Wood Industries, Inc., Gar, Detroit.
York-Heat Div., York-Shipley, Inc., York, Pa.

FURNACES, WARM AIR, FLOOR, GRAVITY

(For suspension beneath floor)

Aladdin Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
• American Gas Machine Co., Albert Lea, Minn. (Oil)
American Radiator & Standard Sanitary Corp., Pittsburgh. (Gas, Oil)
Anchor Burner Co., Oklahoma City, Okla. (Gas)
Andes Range & Furnace Corp., Geneva, N. Y.
Andrews Heater Co., Los Angeles. (Gas)
Armstrong Furnace Company, Columbus, Ohio. (Gas).
• Barnes, Inc., H. C., Long Beach, Calif.
Beck Engineering Combustion Kompany, St. Louis.
Bryant Heater Co., Cleveland. (Gas)
Capps, Joseph, Inc., South Gate, Calif.
Cole Hot Blast Manufacturing Co., Chicago. (Gas and Oil)
Coleman Co., Inc., Wichita, Kans.
Dallman Supply Co., Sacramento, Calif.
DeLuxe Furnace & Wall Heater Co., Los Angeles.
Fraser & Johnston Co., San Francisco.
General Wesco Stove Co., Springfield, Mo.
Gillen Company, J. L., Dowagiac, Mich.
Hammel Radiator Engineering Co., Los Angeles.
Heating Equipment Co., San Francisco. (Gas)
• Holly Heating & Mfg. Co., Pasadena, Calif. (Gas, oil, dual)
Hotstream Heater Co., Cleveland.
Ideal Heating Corp., Los Angeles. (Gas)
International Sales Co., San Francisco.
King Metal Co., Oklahoma City, Okla.
Koons Furnace Co., Danville, Ill.
• Kresky Mfg. Co., Petaluma, Calif. (No. 3 oil).
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
Miller Floor Furnace Co., Oakland, Calif.
Mission Water Heater Co., Los Angeles.
Monarch Heating Co., Los Angeles.
Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
Moore Corporation, Joliet, Ill.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Gas)
Naco Manufacturing Co., Huntington Park, Calif.
Norge Heating & Cond. Div., Borg-Warner Corp., Detroit. (Oil)
O'Keefe & Merritt Co., Los Angeles.
Pacific Gas Heating Co., San Francisco. (Gas)
• Payne Furnace Co., Beverly Hills, Calif. (Gas)
Pioneer Water Heater Co., Los Angeles.
Quaker Manufacturing Co., Chicago. (Oil)
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Royal Air Conditioning Equipment Co., Alhambra, Calif. (Gas)
Stoker-Lad Co., Tacoma, Wash.

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• Surface Combustion, Toledo, O. (Gas)
Tennessee Enamel Mfg. Co., Nashville, Tenn.
U-Ni-Matic Heating Systems, Inc., Los Angeles. (Gas)
Utility Appliance Corporation, Los Angeles. (Gas, butane)
• Viking Manufacturing Corporation, Cleveland.
Ward Heater Co., Los Angeles, Calif. (Gas)
• Zink Co., John, Tulsa, Okla. (Gas).

FURNACES, WARM AIR, GRAVITY, COAL, CAST IRON

Adelta Manufacturing Co., Philadelphia.
Agricola Furnace Co., Inc., Gadsden, Ala.
• Airtemp Div., Chrysler Corporation, Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh
Andes Range & Furnace Corp., Geneva, N. Y.
Barry Furnace Co., Hamilton, O.
Bergstrom Mfg. Corp., Neenah, Wis.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Crane Company, Chicago.
Danville Stove & Mfg Co., Danville, Pa.
• Des Moines Stove Repair Co., Des Moines, Ia.
Detroit-Michigan Stove Co., Detroit, Mich.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Edwards Furnace Co., Wellsboro, Pa.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Co., Springfield, Ill.
Favorite Stove Co., Piqua, O.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis
Fuller-Warren Co., Milwaukee.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hailstead Iron Foundry, Hailstead, Pa.
Hare Engineering Co., Detroit.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky.
• Henry Furnace Co., Medina, O.
Hess-Snyder Co., Massillon, O.
Home Furnace Co., Holland, Mich.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
• International Heater Co., Utica, N. Y.
Iowa Foundry Co., Sioux City, Ia.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Katelman Foundry & Mfg. Co., Council Bluffs, Iowa.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Moore Corp., Joliet, Ill.
• Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Oakland Foundry Co., Belleville, Ill.
• Olsen Mfg. Co., C. A., Elyria, O.
Orbon Stove Co., Belleville, Ill.
Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Clair Foundry Corp., Centralia, Ill.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee, Wis.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Spear Stove and Heater Co., James, Philadelphia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Twentieth Century Heating & Ventilating Co., Akron, O.
• Union Manufacturing Co., Inc., Boyertown, Pa.
United States Radiator Corp., Detroit, Mich.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, COAL, STEEL

• Airtemp Div., Chrysler Corporation, Dayton, O.
Airwasher Corporation, Lansing, Mich.
• American Furnace Co., St. Louis, Mo.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, O.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Chandler Co., Cedar Rapids, Ia.
• Conco Engineering Works, Mendota, Ill.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
Deshler Foundry & Mach. Wks., Deshler, O.
• Des Moines Stove Repair Co., Des Moines, Ia.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
Farquhar Furnace Co., Wilmington, O.
Floral City Co., Monroe, Mich.
• Forest City Foundries Co., Cleveland, O.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis
Gascol Furnace Co., Pittsburgh (Combination Coal and Gas)
Gehri Co., Tacoma, Wash.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis, Mo.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hart Mfg. Co., Louisville, Ky.
• Henry Furnace Company, Medina, O.
Hess-Snyder Co., Massillon, O.
Hess Warming & Ventilating Co., Chicago, Ill.
Home Stove Co., Indianapolis, Ind.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit, Mich.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
• International Heater Co., Utica, N. Y.
• Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Koons Furnace Co., Danville, Ill.
• Leader Iron Works, Inc., Decatur, Ill.
Lennox Furnace Co., Marshalltown, Ia.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
McPherson Furnace & Supply Co., Portland, Ore.
• Majestic Co., Huntington, Ind.
Majestic Furnace Co., Seattle, Wash.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Northwest Foundry & Furnace Works, Portland, Ore.
Nugent Furnaces, Thos., New York City.
• Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
• Peerless Foundry Co., Indianapolis, Ind.
Pennsylvania Engineering Works, New Castle, Pa.
Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Ramey Mfg. Co., Columbus, O.
Ribside Furnace Co., Wausau, Wis.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee, Wis.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Spencer Heater Div., Aviation Corp., Williamsport, Pa.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Stanton Heater Co., Martins Ferry, O.
Sure Comfort Furnace Co., Forest Park, Ill.
• Syncromatic Corporation, Milwaukee.
Thatcher Furnace Company, Garwood, N. J.
Tri-State Heating Supply Co., Fort Wayne, Ind.
Twentieth Century Heating & Ventilating Co., Akron, O.
United States Radiator Corp., Detroit.
• Viking Mfg. Co., Cleveland.
• Waterman-Waterbury Co., Minneapolis, Minn.
Wayne Oil Burner Co., Fort Wayne, Ind.
Westwick & Son, Inc., John, Galena, Ill.
• Wheeling Furnace Corporation, Martins Ferry, O.
• Williamson Heater Co., Cincinnati.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, GAS, CAST IRON

American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis, Mo.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Chandler Co., Cedar Rapids, Ia.
Favorite Stove Co., Piqua, O.
• Forest City Foundries Co., Cleveland, O.
Hart Mfg. Co., Louisville, Ky.
• Henry Furnace Company, Medina, O.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.
Jackson Sheet Metal Works, Ogden, Utah. (Combination Iron and Steel)
Johnson Gas Furnace Corp., North Hollywood, Calif.
Kelsey Heating Co., Syracuse, N. Y.
Marshall Furnace Co., Marshall, Mich.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
• Olsen Manufacturing Co., C. A., Elyria, O.

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Richmond Radiator Co., New York City.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Company, Ashland, O.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
• Surface Combustion, Toledo, O.
Twentieth Century Heating & Ventilating Co., Akron, O.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, GAS, STEEL

• Airtemp Div., Chrysler Corporation, Dayton, O.
Aladdin Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
• American Furnace Co., St. Louis, Mo.
American Radiator and Standard Sanitary Corp., Pittsburgh
Andrews Heating Co., Minneapolis.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Company, Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Bryant Corp., C. L., Cleveland, O.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Campbell Heating Co., Des Moines, Ia.
Cocking, Geo. J., Santa Ana, Calif.
Coleman Co., Inc., Wichita, Kans.
• Conco Engineering Works, Mendota, Ill.
Dallman Supply Co., Sacramento, Calif.
Dalzen Tool & Manufacturing Co., Detroit.
Dornback Furnace & Foundry Co., Cleveland.
• Forest City Foundries Co., Cleveland, O.
Fraser and Johnston Co., San Francisco.
Gascol Furnace Co., Pittsburgh. (Comb. Coal and Gas)
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hammel Radiator Engineering Co., Los Angeles.
Heating Equipment Co., San Francisco.
• Henry Furnace Company, Medina, O.
• Holly Heating & Manufacturing Co., Pasadena, Calif.
Hotentot Company, Inc., Omaha, Nebr.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
International Sales Co., San Francisco.
• Jackson & Church Co., Saginaw, Mich.
Johnston Gas Furnace Corp., North Hollywood, Calif.
Lennox Furnace Co., Marshalltown, Ia.
• Mayflower Air Conditioners, Inc., St. Paul, Minn.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Naco Manufacturing Co., Huntington Park, Calif.
New Mission Heating & Ventilating Co., San Francisco.
Northern Furnace & Supply Co., Billings, Mont.
Nugent Furnaces, Thomas, New York City.
• Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating Company, San Francisco.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Payne Furnace Co., Beverly Hills, Calif.
• Peerless Foundry Co., Inc., Indianapolis, Ind.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Perfection Stove Co., Cleveland.
Royal Air Conditioning Equipment Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
Ryniker Steel Products Company, Billings, Mont.
St. Louis Furnace Mfg. Co., St. Louis.
Schill Mfg. Co., Crestline, Ohio.
Scott-Newcomb, Inc., St. Louis, Mo.
Security Manufacturing Co., Kansas City, Mo.
Sonner Burner Co., Winfield, Kansas.
Stewart Co., W. H., Oklahoma City, Okla.
• Syncromatic Corporation, Milwaukee.
United States Radiator Corp., Detroit.
• Waterman-Waterbury Co., Minneapolis, Minn.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, GRAVITY, OIL, CAST IRON

Adelta Manufacturing Co., Philadelphia.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Chandler Co., Cedar Rapids, Ia.
Edwards Furnace Co., Wellsboro, Pa.
Hart & Crouse Corporation, Utica, N. Y.
Ideal Furnace Co., Detroit.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Marshall Furnace Co., Marshall, Mich.
Montag Stove & Furnace Works, Portland, Ore.
• Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Thatcher Furnace Co., Garwood, N. J.
• Wise Furnace Company, Akron, O.

FURNACES, WARM AIR, GRAVITY, OIL, STEEL

• Airtemp Division, Chrysler Corp., Dayton, O.
Airwasher Corporation, Lansing, Mich.
American Air Conditioning Corp., Sebastopol, Calif.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Brown Steel Tank Co., Minneapolis.
Campbell Heating Co., Des Moines, Ia.
Cary Mfg. Co., Waupaca, Wis.
Chandler Co., Cedar Rapids, Ia.
Coleman Co., Inc., The, Wichita, Kans.
• Conco Engineering Works, Mendota, Ill.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Evanoil Heater Div., Evans Products Co., Detroit.
Farquhar Furnace Co., Wilmington, O.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gasoroil Mfg. Corp., Genoa City, Wis.
Gehri Co., Tacoma, Wash.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gillen Co., J. L., Dowagiac, Mich.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
• Henry Furnace Co., Medina, O.
• Hess Warming & Ventilating Co., Chicago.
Hotentot Co., Inc., Omaha, Nebr.
Ideal Furnace Co., Detroit.
International Sales Co., San Francisco.
Johnston Gas Furnace Corp., North Hollywood, Calif.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Koons Furnace Co., Danville, Ill.
Kruse Co., Indianapolis.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
• May-Fiebeger Co., Newark, O.
• Mayflower Air Conditioners, Inc., St. Paul, Minn.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Northwest Foundry & Furnace Works, Portland, Ore.
Nugent Furnaces, Thomas, New York Ctiy.
• Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Peerless Foundry Co., Indianapolis.
Perfection Stove Co., Cleveland.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Quaker Manufacturing Co., Chicago.
• Quincy Stove Manufacturing Co., Quincy, Ill.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Scott-Newcomb, Inc., St. Louis.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Sure Comfort Furnace Co., Forest Park, Ill.
• Syncromatic Corporation, Milwaukee.
Thatcher Furnace Co., Garwood, N. J.
United States Radiator Corp., Detroit.
• Viking Mfg. Corp., Cleveland.
• Waterman-Waterbury Co., Minneapolis.
Wayne Oil Burner Co., Fort Wayne, Ind.
Western Blower Co., Seattle, Wash.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, GRAVITY, STOKER, CAST IRON

Adelta Manufacturing Co., Philadelphia.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Anchor Stove & Range Co., New Albany, Ind.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Stove & Mfg. Co., Quincy, Ill.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Ideal Furnace Co., Detroit.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee. (Double radiator)
• Premier Furnace Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.

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• Schwab Furnace Co., Milwaukee, Wis.
Sioux City Fdy. & Boiler Co., Sioux City, Ia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.

FURNACES, WARM AIR, GRAVITY, STOKER, STEEL

Airwasher Corporation, Lansing, Mich.
• American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Beck Engineering Combustion Kompany, St. Louis.
Campbell Heating Co., Des Moines, Ia.
• Conco Engineering Works, Mendota, Ill.
Floral City Co., Monroe, Mich.
• Forest City Foundries Co., Niagara Furnace Div., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
• Henry Furnace Co., Medina, O.
Hess Warming & Ventilating Co., Chicago.
Ideal Furnace Co., Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Keith Furnace Co., Des Moines, Ia.
Lennox Furnace Co., Marshalltown, Ia.
• Majestic Co., Huntington, Ind.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Northwest Stove & Furnace Works, Portland, Ore.
• Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
• Premier Furnace Co., Dowagiac, Mich.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Round Oak Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
• Schwab Furnace Co., Milwaukee.
Spencer Heater Div., Aviation Corp., Williamsport, Pa.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
• Stok-A-Fire Co., Inc., University City, Mo.
Sun-Fire Stoker Corporation, New Albany, Ind.
Sure Comfort Furnace Co., Forest Park, Ill.
• Syncromatic Corporation, Milwaukee.
• Waterman-Waterbury Co., Minneapolis.
• Williamson Heater Co., Cincinnati.

FURNACES, WARM AIR, GRAVITY, WALL

(To Be Built into Partitions)

Aladdin Heating Corporation, Oakland, Calif.
Coleman Company, Inc., Wichita, Kan.
• Holly Heating & Mfg. Co., Pasadena, Calif.
• Rheem Mfg. Co., Stokermatic Div., Salt Lake City, Utah.
• Zinc Co., John, Tulsa, Okla.

FURNACES, WARM AIR, HORIZONTAL

American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Campbell Heating Co., E. K., Kansas City, Mo.
Columbus Heating & Ventilating Co., Columbus, O.
Dravo Corporation, Pittsburgh.
Floral City Co., Monroe, Mich.
International Sales Co., San Francisco.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
McPherson Furnace & Supply Co., Portland, Ore.
Moncrief Furnace Co., Atlanta, Ga.
Montag Stove & Furnace Works, Portland, Ore.
• Mueller Furnace Co., L. J., Milwaukee.
National Heater Company, Minneapolis.
Northwest Foundry & Furnace Works, Portland, Ore.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Ramey Mfg. Co., Columbus, O.
Rosebraugh Co., W. W., Salem, Ore.
Sandberg Co., H. J., Portland, Ore.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Twentieth Century Heating & Ventilating Co., Akron, O.
Western Blower Co., Seattle, Wash.
Western Furnaces, Inc., Tacoma, Wash.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, CAST IRON

Agricola Furnace Co., Inc., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, Ill.
• American Furnace Co., St. Louis.
American Furnace & Foundry Co., Milan, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Andes Range & Furnace Corp., Geneva, N. Y.
Barry Furnace Co., Hamilton, O.
Chandler Co., Cedar Rapids, Ia.
Danville Stove & Mfg. Co., Danville, Pa.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Edwards Furnace Co., Wellsboro, Pa.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Favorite Stove Co., Piqua, O.
• Forest City Foundries Co., Cleveland.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky.
• Henry Furnace Co., Medina, O.
Home Furnace Co., Holland, Mich.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, O.
• Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Moore Corp., Joliet, Ill.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Mfg. Co., C. A., Elyria, O.
Orbon Stove Co., Belleville, Ill.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Rybolt Heater Co., Ashland, O.
St. Clair Foundry Corp., Centralia, Ill.
Schill Mfg. Co., Crestline, O.
• Schwab Furnace Co., Milwaukee.
Sioux City Foundry & Boiler Co., Sioux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
Thatcher Furnace Co., Garwood, N. J.
Twentieth Century Heating & Ventilating Co., Akron, O.
United States Radiator Corp., Detroit.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, STEEL

Aladdin Heating Corp., Oakland, Calif.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Campbell Heating Co., Des Moines, Ia.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Grossenbacher Furnace Co., St. Louis.
Hart Mfg. Co., Louisville, Ky.
Hess Warming & Ventilating Co., Chicago.
Home Stove Co., Indianapolis.
Ideal Furnace Co., Detroit.
• International Heater Co., Utica, N. Y.
• Jackson & Church Co., Saginaw, Mich.
Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Koons Furnace Co., Danville, Ill.
Lennox Furnace Co., Marshalltown, Ia.
Majestic Furnace Co., Seattle, Wash.
• May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.
Naco Manufacturing Co., Huntington Park, Calif.
Northwest Foundry & Furnace Works, Portland, Ore.
Nugent Furnaces, Thos., New York City.
Orbon Stove Co., Belleville, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pittsburgh Furnace Parts Co., Pittsburgh.
Ramey Mfg. Co., Columbus, O.
Rosebraugh Co., W. W., Salem, Ore.
• Schwab Furnace Co., Milwaukee.
Stanton Heater Co., Martins Ferry, O.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
• Syncromatic Corporation, Milwaukee, Wis.
United States Radiator Corp., Detroit.
• Waterman-Waterbury Co., Minneapolis, Minn.

FURNACES, WARM AIR, WOOD BURNING, CAST IRON

Hart & Crouse Corporation, Utica, N. Y.
Homer Furnace & Foundry Corp., Coldwater, Mich.
• International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
• Majestic Co., Huntington, Ind.
Moncreif Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.
Oakland Foundry Co., Belleville, Ill.
Portland Stove Foundry Co., Portland, Me.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

• Schwab Furnace Co., Milwaukee.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
Western Furnaces, Inc., Tacoma, Wash.

FURNACES, WARM AIR, WOOD BURNING, STEEL

• American Furnace Co., St. Louis.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
• Hess Warming & Ventilating Co., Chicago.
McPherson Furnace & Supply Co., Portland, Ore. (Also Sawdust)
• Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.
Northwest Foundry & Furnace Works, Portland, Ore.
Nugent Furnaces, Thomas, New York City.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Rosebraugh Co., W. W., Salem, Ore.
Sandberg Co., H. J., Portland, Ore.
• Schwab Furnace Co., Milwaukee.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
• Syncromatic Corporation, Milwaukee.

GAGES, AIR FILTER

Air Filter Engineering Co., Chicago.
Defender Instrument and Regulator Co., St. Louis.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Hays Corporation, Michigan City, Ind.
Herbusch Corporation, Simplex Control Div., St. Louis.
Hill, E. Vernon, Chicago.
Hotstream Heater Co., Cleveland.
Huyette Co., Inc., Paul B., Philadelphia.
Meriam Co., Cleveland.
Uehling Instrument Co., Paterson, N. J.

GAS BURNERS

See Burners, Gas

GAGES, INDICATING, DRAFT, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh.
Bristol Company, Waterbury, Conn.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis.
Detroit Air Conditioning Service Co., Inc., Detroit.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Foxboro Co., Foxboro, Mass.
Hays Corp., Michigan City, Ind.
Hill, E. Vernon, Chicago.
Hotstream Heater Co., The, Cleveland.
Marsh Corporation, Jas. P., Chicago.
Meriam Co., Cleveland.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Scientific Instrument Co., Detroit.
Uehling Instrument Co., Paterson, N. J.
Weaver Mfg. Co., Springfield, Ill.

GATES, BLAST

See Blast Gates

GLASS, SAFETY

Libbey-Owens-Ford Glass Co., Toledo, O.
Pittsburgh Plate Glass Co., Pittsburgh.
Saftee Glass Co., Philadelphia.

GLASS, WIRE, FOR SKYLIGHTS

Atcheson Glass Co., T. J., Buffalo.
Bache & Co., Semon, New York City.
Libbey, Owens, Ford Glass Co., Toledo, O.
Mississippi Glass Co., New York City.
Pennsylvania Wire Glass Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Richards, J. Merrill, Boston.

GLAZING COMPOUNDS

See Compounds, Glazing

GRILLES, HEATING AND VENTILATING

See Faces and Registers

GRILLES, VENTILATING SYSTEM (METAL)

Acme Wire & Iron Works, Detroit.
• Air Control Products, Inc., Coopersville, Mich.
• Auer Register Co., Cleveland.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Best Register Co., Milwaukee, Wis.
Diamond Manufacturing Co., Wyoming, Pa.
Erdle Perforating Company, Rochester, N. Y.
• Harrington & King Perforating Co., Chicago.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Manufacturing Co., Carbondale, Pa.
• Independent Register Co., Cleveland, O.
Mundt & Sons, Charles, Jersey City, N. J.
Newman Brothers, Inc., Cincinnati.
• Rock Island Register Co., Rock Island, Ill.
Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Air Conditioning Corp., Minneapolis.
• Waterloo Register Co., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago.

GRINDERS, BUFFERS, POLISHERS AND SANDERS

See Buffers, Grinders, Polishers and Sanders

GROOVING MACHINES

See Machines, Grooving

GUARDS, MACHINERY

Acme Wire & Iron Works, Detroit.
Biersach & Niedermeyer Co., Milwaukee.
California Wire Cloth Corporation, Oakland, Calif.
Chicago Metal Mfg. Co., Chicago.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Davis & Siehl Co., Cincinnati.
• Harrington & King Perforating Co., Chicago.
Haskins-Haire Wire Works, Worcester, Mass.
Hendrick Manufacturing Co., Carbondale, Pa.
Korb-Pettit Wire Fabrics & Iron Works, Inc., Philadelphia.
Littleford Bros., Inc., Cincinnati.
Logan Co., Inc., Louisville.
Myers Mfg. Co., Fred L., Hamilton, Ohio.
New York Wire Works, Inc., Newark, N. J.
Providence Wire Works, Providence, R. I.
Overly Manufacturing Co., Greensburg, Pa.
Riester & Thesmacher Co., Cleveland.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.
Wickwire Spencer Steel Co., New York City.
Wire & Iron Products, Inc., Detroit.

GUARDS, SNOW

• Berger Brothers Co., Philadelphia.
Barnard Co., Geo. A., Worcester, Mass.
Boyd & Co., Inc., Chas. P., Philadelphia.
Cartier & Sons Co., M. N., Providence, R. I.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Danzer Metal Works Co., Hagerstown, Md. (All types).
Downs-Smith Brass & Copper Co., New York City.
Folsom Snow Guard Co., Millis, Mass.
Hamblin & Russell Mfg. Co., Inc., Worcester, Mass.
• Hussey & Co., C. G., Pittsburgh. (Copper)
• Levow, David, New York City.
Maysteel Products, Inc., Milwaukee.
Obdyke, Inc., B. P., Philadelphia.
Royal-Apex Mfg. Corp., Brooklyn. (Cast Iron)

GUNS, SPRAY, METALS

Turner Brass Works, Sycamore, Ill.

GUNS, SPRAY, PAINT

Aeroil Products Co., West New York, N. J.
Binks Mfg. Co., Chicago.
Black Manufacturing Co., Baltimore.
De Vilbiss Co., Toledo, O.
Eclipse Air Brush Company, Inc., Newark, N. J.
Electric Sprayit Co., Sheboygan, Wis.
Norris Airless Painting Machinery Corp., Greenwich, Conn.
Plummer Spray Equipment Co., Napoleon, Ohio.
Spray Engineering Co., Somerville, Mass.

GUTTER FORMERS

See Machines, Gutter Forming

GUTTERS

See Eaves Trough and Gutters

HAMMERS, ELECTRIC OR PNEUMATIC

Borm Manufacturing Co., Elgin, Ill. (Pneumatic)
Brown-Appton Co., New York City. (Pneumatic).
Buckeye Tools Corp., Dayton, O. (Pneumatic riveter)
Chicago Pneumatic Tool Co., New York City. (Pneumatic).
Cleveland Pneumatic Tool Co., Cleveland. (Pneumatic)
Coast Pneumatic Tool Co., Los Angeles. (Pneumatic).
Ideal Commutator Dresser Co., Sycamore, Ill. (Pneumatic)
• Independence Pneumatic Tool Co., Chicago. (Electric)
Keller Tool Company, Grand Haven, Mich. (Pneumatic).
Millers Falls Co., Greenfield, Mass. (Electric)
Phillips Drill Co., Chicago. (Electric)
Stanley Tools, New Britain, Conn. (Electric).
Superior Manufacturing Co., Cleveland. (Pneumatic)
Van Dorn Electric Tool Co., Towson, Md. (Electric)
• Whiting Corporation, Harvey, Ill.
• Wodack Electric Tool Corp., Chicago. (Electric).
Yoder Co., Cleveland.

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HANGERS

See Fittings and Accessories, Eaves Trough and Gutter

HARDWARE, FOR CABINETS AND CASINGS

(Handles, name plates, etc.)

American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, Hinges, Catches, etc.)
American Emblem Co., Utica, N. Y. (Name Plates)
American Insulator Corp., New Freedom, Pa.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless).
Brasco Manufacturing Co., Harvey, Ill.
Corbin Div., P. & F., New Britain, Conn. (Handles, catches, locks, hinges)
Crowe Name Plate & Mfg. Co., Chicago.
Dickey-Grabler Co., Cleveland. (Name Plate)
Etched Products Co., Long Island City, N. Y. (Name Plates)
General Etching & Mfg. Co., Chicago. (Name Plates)
Grammes, L. F., & Sons, Inc., Allentown, Pa.
Greenberg's Sons, M., San Francisco. (Name plates, letters, hinges, bolts, latches)
Hartwell Engineering Co., Los Angeles. (Flush latches, hinges)
Imperial Molded Products Corp., Chicago. (Plastic Handles, Pulls and Knobs)
Mason & Sons, F. E., Batavia, N. Y. (Name Plates)
Metal Marker Co., Cleveland. (Name Plates)
Meyers Mfg. Co., Fred L., Hamilton, O. (Nameplates)
National Brass Co., Grand Rapids, Mich.
National Lock Co., Rockford, Ill.
New York Wire Works, Inc., Newark, N. J.
Premier Metal Etching Co., Long Island City. (Name Plates)
Soss Manufacturing Co., Detroit. (Invisible Hinges)
Stafford Co., N., Brooklyn, N. Y. (Name Plates)

HEADS

See Fittings and Accessories, Conductor

HEAT TRANSFER SURFACE

See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling Water

HEATERS, CIRCULATING, CABINET TYPE

Acme Tin Plate & Roofing Supply Co., Philadelphia. (Electric)
Agricola Furnace Co., Inc., Gadsden, Ala. (Coal)
• American Gas Machine Company, Albert Lea, Minn. (Oil)
American Stove Co., Lorain Div., Lorain, O. (Oil)
Andrews Heating Co., Minneapolis. (Coal and Oil)
Auburn Burner Co., Auburn, Ind. (Oil)
Bern's Specialty Mfg. Co., Chicago. (Steam)
Cole Hot Blast Mfg. Co., Chicago. (Coal, Oil, Gas, Wood)
Coleman Company, Inc., Wichita, Kans.
Coroaire Heater Corporation, Cleveland. (Gas, Oil).
Dallman Supply Co., Sacramento, Calif. (Gas)
Day & Night Manufacturing Co., Monrovia, Calif. (Gas)
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich. (Oil)
Edwards Mfg. Co., Inc., Cincinnati. (Coal, Coke, Wood)
Enterprise Foundry Co., Belleville, Ill. (Coal and Wood)
Estate Stove Co., Hamilton, O. (Coal, Oil, Gas)
Evanoil Heater Div., Evans Products Co., Detroit. (Oil & Gas)
Excelsior Stove & Mfg. Co., Quincy, Ill.
Florence Stove Co., Garner, Mass. (Oil)
General Gas Light Co., Kalamazoo, Mich. (Gas)
Hammel Radiator Engineering Co., Los Angeles. (Gas).
Heating Equipment Co., San Francisco. (Gas)
Independence Stove & Furnace Co., Independence, Mo. (Gas or Coal)
Kehm Corporation, Chicago. (Gas and Coal)
• Kresky Mfg. Co., Petaluma, Calif. (Oil)
Laco Oil Burner Co., Griswold, Ia. (Oil)
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
Lonergan Manufacturing Co., Albion, Mich. (Oil)
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Coal, Gas Oil and Wood)
Moore Corporation, Joliet, Ill. (Coal, Gas, Oil)
Naco Manufacturing Co., Huntington Park, Calif. (Gas)
Ohio Foundry & Mfg. Co., Steubenville, O. (Gas)
• Patten Co., J. V., Sycamore, Ill. (Coal, oil and gas)
• Payne Furnace Co., Beverly Hills, Calif.
• Perfection Stove Co., Cleveland. (Oil)
Pernot & Rich, Inc., Los Angeles. (Gas)
Pittston Stove Co., Pittston, Pa. (Coal or Wood)
Quaker Mfg. Co., Chicago. (Oil)
• Quincy Stove Mfg. Co., Quincy, Ill. (Oil and Coal)
Resnor Mfg. Co., Mercer, Pa. (Gas)
Royal Air Conditioning Equip. Co., Alhambra, Calif. (Gas)
Schoedinger, F. O., Columbus, O.
Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil)
• Surface Combustion, Toledo, O. (Gas)
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
• Utility Appliance Corporation, Los Angeles, (Gas, Butane).
Victor Oil Burner Mfg. Co., Hartford, Conn.
• Viking Mfg. Corp., Cleveland. (Oil)
Washington Stove Works, Everett, Wash. (Wood).

HEATERS, DIRECT FIRED

See Furnaces

HEATERS, RADIANT, GAS-FIRED

Andrews Heater Co., Los Angeles. (Wall)
Day & Night Manufacturing Co., Monravia, Calif.
General Gas Light Co., Kalamazoo, Mich.
Hammel Radiator Engineering Co., Los Angeles.
Hotstream Heater Co., Cleveland. (Wall type).
Naco Manufacturing Co., Huntington Park, Calif. (Wall recess)
Schoedinger, F. O., Columbus, O.
Tennessee Enamel Mfg. Co., Nashville, Tenn.

HEATERS, SCHOOL ROOM

Agricola Furnace Co., Inc., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, I..
American Furnace & Foundry Co., Milan, Mich.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Barry Furnace Co., Hamilton, O.
Campbell Heating Co., Des Moines, Ia.
Chandler Co., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago (Gas or Oil)
Daniels Mfg. Co., Inc., Sam, Hartwick, Vermont. (Wood)
Danville Stove & Mfg. Co., Danville, Pa.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Dravo Corporation, Pittsburgh.
Excelsior Stove & Mfg. Co., Quincy, Ill.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky. (Coal and Gas)
Heating Equipment Co., San Francisco. (Gas)
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, Ohio.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
• International Heater Co., Utica, N. Y.
Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Koons Furnace Co., Danville, Ill.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, Ohio.
• Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
Moore Corp., Joliet, Ill.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
• Nelson Corporation, Herman, Moline, Ill.
Nesbitt, Inc., John J., Philadelphia.
Orbon Stove Co., Belleville, Ill.
Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas)
• Payne Furnace Co., Beverly Hills, Calif.
• Perfection Stove Co., Cleveland. (Oil)
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
St. Clair Foundry Corp., Centralia, Ill.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
• Syncromatic Corporation, Milwaukee.
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
Twentieth Century Heating & Ventilating Co., Akron, O.
• Waterman-Waterbury Co., Minneapolis, Minn. (Coal, Oil and Wood)
Western Blower Co., Seattle, Wash.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

HEATERS, WATER, OIL-FIRED

• Air Devices, Inc., New York.
• Airtemp Division, Chrysler Corp., Dayton, O.
Aldrich Company, Wyoming, Ill.
• American Gas Machine Company, Albert Lea, Minn.
• Anchor Post Fence Co., Heating Div., Baltimore.
Auburn Burner Company, Auburn, Ind.
Automatic Burner Corporation, Chicago.
• Automatic Humidifier Co., Cedar Falls, Iowa.
• Century Engineering Corporation, Cedar Rapids, Iowa.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Coleman Company, Inc., Wichita, Kans.
• Conco Engineering Works, Mendota, Ill.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Electrol Mfg. Co., Passaic, N. J.
Florence Stove Co., Gardner, Mass.
Gerstein & Cooper Co., South Boston, Mass.
Gillen Company, J. L., Dowagiac, Mich.
Hotstream Heater Co., Cleveland.
• Jennings, Freeland L., Lima, O. (Oil burner with integral domestic water heating unit)
Johnson Co., S. T., Oakland, Cal.
Kleen-Heet, Inc., Chicago.
• Kresky Mfg. Co., Petaluma, Calif.
Little Burner Co., Inc., H. C., San Rafael, Cal.

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Lochinvar Products Div., Michigan Tank & Furnace Corp., Detroit.
Merit Water Heater Co., Compton, Calif.
Lonergan Manufacturing Co., Albion, Mich.
Michigan Tank & Furnace Corp., Lochinvar Products Div., Detroit. (Multiple Stage)
National Airoil Burner Co., Inc., Philadelphia.
• Nu-Way Corp., Rock Island, Ill.
Ohio Foundry & Mfg. Co., Steubenville, Ohio.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit.
Pan-American Engineering Company, Berkeley, Calif.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
• Perfection Stove Co., Inc., Cleveland.
• Petroleum Heat & Power Co., Stamford, Conn.
Preferred Utilities Mfg. Corp., New York City.
Quaker Manufacturing Co., Chicago.
• Quincy Stove Mfg. Co., Quincy, Ill.
Ray Oil Burner Company, San Francisco.
Reif-Rexoil, Inc., Buffalo.
Scott-Newcomb, Inc., St. Louis.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corporation, Detroit.
• Viking Mfg. Corp., Cleveland.
Wayne Oil Burner Co., Fort Wayne, Ind.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
York-Heat Div., York-Shipley, Inc., York, Pa.

HEATERS, WATER, STOKER-FIRED

• Catskill Metal Works, Inc., Catskill, N. Y.
• Gehl Bros. Mfg. Co., West Bend, Wis.
Pan-American Engineering Company, Berkeley, Calif.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.

HEATERS, WATER, STORAGE, ELECTRIC

Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Cleveland Heater Co., Cleveland.
Red Spot Electric Co., Tacoma, Wash.
Smith Corporation, A. O., Milwaukee.
Tru-Mac Mfg. Co., Reading, Mass.

HEATERS, WATER, STORAGE, GAS

• American Gas Machine Co., Albert Lea, Minn.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Coleman Co., Inc., Wichita, Kans.
Continental Water Heater Co., Ltd., Los Angeles.
Crane Company, Chicago.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
FauceHot Heater Co., La Porte, Ind.
Handley Brown Heater Co., Jackson, Mich.
Hotstream Heater Co., Cleveland.
Hoyt Heater Co., Los Angeles.
Koil-Les Heater Co., Geneva, Ill.
Lovekin Water Heater Co., Philadelphia.
Merit Water Heater Co., Compton, Calif.
Mission Water Heater Co., Los Angeles.
Mustee Heater Co., Cleveland.
Naco Manufacturing Co., Huntington Park, Calif.
Pennsylvania Range Boiler Co., Philadelphia.
Schoedinger, F. O., Columbus, Ohio.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Pan American Engineering Co., Berkeley, Calif.
Security Manufacturing Co., Kansas City.
Smith Corporation, A. O., Milwaukee.
Wayne Oil Burner Co., Fort Wayne, Ind.

HEATING COILS

See Coils, Heating

HOISTS, HAND AND POWER

American Chain Division, York, Pa.
American Engineering Co., Philadelphia.
• American Monorail Co., Cleveland (Electric)
Chester Mfg. Co., Lisbon, Ohio.
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
• Conco Engineering Works, Mendota, Ill.
Detroit Hoist & Machine Co., Detroit.
Electro Lift, Inc., New York City.
Euclid Crane & Hoist Co., Euclid, Ohio.
Ford Chain Block Div., American Chain & Cable Co., Inc., Philadelphia.
Harnischfeger Corporation, Milwaukee.
Harrington Co., Philadelphia.
Louden Company, Fairfield, Iowa.
McCollum Hoist & Mfg. Co., Downers Grove, Ill.
• Master Electric Co., Dayton, Ohio.
Philadelphia Chain Block & Mfg. Co., Inc., Philadelphia.
Reading Chain & Block Corporation, Reading, Pa.
Richards-Wilcox Manufacturing Co., Aurora, Ill.
Robbins & Myers, Inc., Springfield, Ohio.
Shepard Niles Crane & Hoist Corporation, Montour Falls, N. Y.
Union Mfg. Co., New Britain, Conn.
Wright Manufacturing Division, American Chain & Cable Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Philadelphia.

HOODS, DRAFT, GAS

See Draft Diverters for Gas Heaters

HOSE AND FITTINGS, METAL, FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York City.
Chicago Metal Hose Corporation, Maywood, Ill.
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Everhot Products Co., Chicago, Ill.
Packless Metal Products Corp., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.
Seamless Co., Long Island City, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Zallas Brothers & Johnson, Wilmington, Del.

HOUSINGS, BLOWER

• Air Controls, Inc., Cleveland.
• Brundage Co., Kalamazoo, Mich.
• Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, Ohio.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Stamping Co., Detroit.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago.
Northern Blower Co., Cleveland.
Royal Air Conditioning Equipment Co., Alhambra, Cal.
Sandberg Co., H. J., Portland, Ore.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Torrington Mfg. Co., Torrington, Conn.
Trade-Wind Motorfans, Inc., Los Angeles.
• U. S. Air Conditioning Corp., Minneapolis.
Utica Products, Incorporated, Utica, N. Y.
• Viking Air Conditioning Corp., Cleveland.

HOUSINGS, FAN, PROPELLER

Circulators & Devices Mfg. Corp., New York
Commercial Shearing & Stamping Co., Youngstown, Ohio, (Venturi type)
Dahlstrom Metallic Door Co., Jamestown, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Northern Blower Co., Cleveland.

HUMIDIFIER FITTINGS

See Fittings, Humidifier, Water Line

HUMIDIFIER VALVES

See Valves, Humidifier, Water Level

HUMIDIFIERS, FURNACE, EVAPORATION, AUTOMATIC

Agricola Furnace Co., Inc., Gadsden, Ala.
American Air Conditioning Co., Minneapolis.
• Automatic Humidifier Co., Cedar Falls, Ia.
• Badger Corporation, Milwaukee.
Barclay, Inc., Robert, Chicago.
Bard Manufacturing Company, Bryan, Ohio.
Cary Mfg. Co., Waupaca, Wis.
Chandler Co., Cedar Rapids, Ia.
• Cleveland Humidifier Co., Cleveland.
Glasby Manufacturing Company, Inc., J. P., Belleville, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Ideal Furnace Co., Detroit, Mich.
Iowa Foundry Co., Sioux City, Ia.
Kraker, Henry, Holland, Mich.
Little Burner Co., Inc., H. C., San Rafael, Calif.
• McDonnell & Miller, Chicago.
• Maid-O'-Mist, Inc., Chicago.
Marshall Furnace Co., Marshall, Mich.
• Mayflower Air-Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Nugent Furnaces, Thomas, New York City.
• Olsen Manufacturing Co., C. A., Elyria, Ohio.
• Patten Co., J. V., Syracuse, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pfening Co., Fred D., Columbus, Ohio.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Skilbeck Mfg. Co., Kenosha, Wis.
• Skuttle Manufacturing Co., Detroit.
Somers, Inc., H. J., Detroit, Mich.
Thatcher Furnace Co., Garwood, N. J.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.

HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

• Air Controls, Inc., Cleveland.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

HANGERS

See Fittings and Accessories, Eaves Trough and Gutter

HARDWARE, FOR CABINETS AND CASINGS

(Handles, name plates, etc.)

American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, Hinges, Catches, etc.)
American Emblem Co., Utica, N. Y. (Name Plates)
American Insulator Corp., New Freedom, Pa.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless).
Brasco Manufacturing Co., Harvey, Ill.
Corbin Div., P. & F., New Britain, Conn. (Handles, catches, locks, hinges)
Crowe Name Plate & Mfg. Co., Chicago.
Dickey-Grabler Co., Cleveland. (Name Plate)
Etched Products Co., Long Island City, N. Y. (Name Plates)
General Etching & Mfg. Co., Chicago. (Name Plates)
Grammes, L. F., & Sons, Inc., Allentown, Pa.
Greenberg's Sons, M., San Francisco. (Name plates, letters, hinges, bolts, latches)
Hartwell Engineering Co., Los Angeles. (Flush latches, hinges)
Imperial Molded Products Corp., Chicago. (Plastic Handles, Pulls and Knobs)
Mason & Sons, F. E., Batavia, N. Y. (Name Plates)
Metal Marker Co., Cleveland. (Name Plates)
Meyers Mfg. Co., Fred L., Hamilton, O. (Nameplates)
National Brass Co., Grand Rapids, Mich.
National Lock Co., Rockford, Ill.
New York Wire Works, Inc., Newark, N. J.
Premier Metal Etching Co., Long Island City. (Name Plates)
Soss Manufacturing Co., Detroit. (Invisible Hinges)
Stafford Co., N., Brooklyn, N. Y. (Name Plates)

HEADS

See Fittings and Accessories, Conductor

HEAT TRANSFER SURFACE

See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling Water

HEATERS, CIRCULATING, CABINET TYPE

Acme Tin Plate & Roofing Supply Co., Philadelphia. (Electric)
Agricola Furnace Co., Inc., Gadsden, Ala. (Coal)
• American Gas Machine Company, Albert Lea, Minn. (Oil)
American Stove Co., Lorain Div., Lorain, O. (Oil)
Andrews Heating Co., Minneapolis. (Coal and Oil)
Auburn Burner Co., Auburn, Ind. (Oil)
Bern's Specialty Mfg. Co., Chicago. (Steam)
Cole Hot Blast Mfg. Co., Chicago. (Coal, Oil, Gas, Wood)
Coleman Company, Inc., Wichita, Kans.
Coroaire Heater Corporation, Cleveland. (Gas, Oil).
Dallman Supply Co., Sacramento, Calif. (Gas)
Day & Night Manufacturing Co., Monrovia, Calif. (Gas)
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich. (Oil)
Edwards Mfg. Co., Inc., Cincinnati. (Coal, Coke, Wood)
Enterprise Foundry Co., Belleville, Ill. (Coal and Wood)
Estate Stove Co., Hamilton, O. (Coal, Oil, Gas)
Evanoil Heater Div., Evans Products Co., Detroit. (Oil & Gas)
Excelsior Stove & Mfg. Co., Quincy, Ill.
Florence Stove Co., Garner, Mass. (Oil)
General Gas Light Co., Kalamazoo, Mich. (Gas)
Hammel Radiator Engineering Co., Los Angeles. (Gas).
Heating Equipment Co., San Francisco. (Gas)
Independence Stove & Furnace Co., Independence, Mo. (Gas or Coal)
Kehm Corporation, Chicago. (Gas and Coal)
• Kresky Mfg. Co., Petaluma, Calif. (Oil)
Laco Oil Burner Co., Griswold, Ia. (Oil)
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
Lonergan Manufacturing Co., Albion, Mich. (Oil)
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Coal, Gas Oil and Wood)
Moore Corporation, Joliet, Ill. (Coal, Gas, Oil)
Naco Manufacturing Co., Huntington Park, Calif. (Gas)
Ohio Foundry & Mfg. Co., Steubenville, O. (Gas)
• Patten Co., J. V., Sycamore, Ill. (Coal, oil and gas)
• Payne Furnace Co., Beverly Hills, Calif.
• Perfection Stove Co., Cleveland. (Oil)
Pernot & Rich, Inc., Los Angeles. (Gas)
Pittston Stove Co., Pittston, Pa. (Coal or Wood)
Quaker Mfg. Co., Chicago. (Oil)
• Quincy Stove Mfg. Co., Quincy, Ill. (Oil and Coal)
Reznor Mfg. Co., Mercer, Pa. (Gas)
Royal Air Conditioning Equip. Co., Alhambra, Calif. (Gas)
Schoedinger, F. O., Columbus, O.
Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil)
• Surface Combustion, Toledo, O. (Gas)
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
• Utility Appliance Corporation, Los Angeles, (Gas, Butane).
Victor Oil Burner Mfg. Co., Hartford, Conn.
• Viking Mfg. Corp., Cleveland. (Oil)
Washington Stove Works, Everett, Wash. (Wood).

HEATERS, DIRECT FIRED

See Furnaces

HEATERS, RADIANT, GAS-FIRED

Andrews Heater Co., Los Angeles. (Wall)
Day & Night Manufacturing Co., Monravia, Calif.
General Gas Light Co., Kalamazoo, Mich.
Hammel Radiator Engineering Co., Los Angeles.
Hotstream Heater Co., Cleveland. (Wall type).
Naco Manufacturing Co., Huntington Park, Calif. (Wall recess)
Schoedinger, F. O., Columbus, O.
Tennessee Enamel Mfg. Co., Nashville, Tenn.

HEATERS, SCHOOL ROOM

Agricola Furnace Co., Inc., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, I..
American Furnace & Foundry Co., Milan, Mich.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Barry Furnace Co., Hamilton, O.
Campbell Heating Co., Des Moines, Ia.
Chandler Co., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago (Gas or Oil)
Daniels Mfg. Co., Inc., Sam, Hartwick, Vermont. (Wood)
Danville Stove & Mfg. Co., Danville, Pa.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Dravo Corporation, Pittsburgh.
Excelsior Stove & Mfg. Co., Quincy, Ill.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky. (Coal and Gas)
Heating Equipment Co., San Francisco. (Gas)
• Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, Ohio.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
• International Heater Co., Utica, N. Y.
Kehm Corporation, Chicago, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Koons Furnace Co., Danville, Ill.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
• May-Fiebeger Co., Newark, Ohio.
• Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
Moore Corp., Joliet, Ill.
• Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
• Nelson Corporation, Herman, Moline, Ill.
Nesbitt, Inc., John J., Philadelphia.
Orbon Stove Co., Belleville, Ill.
Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas)
• Payne Furnace Co., Beverly Hills, Calif.
• Perfection Stove Co., Cleveland. (Oil)
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
• Rudy Furnace Co., Dowagiac, Mich.
St. Clair Foundry Corp., Centralia, Ill.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
• Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.
• Syncromatic Corporation, Milwaukee.
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
Twentieth Century Heating & Ventilating Co., Akron, O.
• Waterman-Waterbury Co., Minneapolis, Minn. (Coal, Oil and Wood)
Western Blower Co., Seattle, Wash.
• Williamson Heater Co., Cincinnati.
• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

HEATERS, WATER, OIL-FIRED

• Air Devices, Inc., New York.
• Airtemp Division, Chrysler Corp., Dayton, O.
Aldrich Company, Wyoming, Ill.
• American Gas Machine Company, Albert Lea, Minn.
• Anchor Post Fence Co., Heating Div., Baltimore.
Auburn Burner Company, Auburn, Ind.
Automatic Burner Corporation, Chicago.
• Automatic Humidifier Co., Cedar Falls, Iowa.
• Century Engineering Corporation, Cedar Rapids, Iowa.
• Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Coleman Company, Inc., Wichita, Kans.
• Conco Engineering Works, Mendota, Ill.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Electrol Mfg. Co., Passaic, N. J.
Florence Stove Co., Gardner, Mass.
Gerstein & Cooper Co., South Boston, Mass.
Gillen Company, J. L., Dowagiac, Mich.
Hotstream Heater Co., Cleveland.
• Jennings, Freeland L., Lima, O. (Oil burner with integral domestic water heating unit)
Johnson Co., S. T., Oakland, Cal.
Kleen-Heet, Inc., Chicago.
• Kresky Mfg. Co., Petaluma, Calif.
Little Burner Co., Inc., H. C., San Rafael, Cal.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Lochinvar Products Div., Michigan Tank & Furnace Corp., Detroit.
Merit Water Heater Co., Compton, Calif.
Lonergan Manufacturing Co., Albion, Mich.
Michigan Tank & Furnace Corp., Lochinvar Products Div., Detroit. (Multiple Stage)
National Airoil Burner Co., Inc., Philadelphia.
• Nu-Way Corp., Rock Island, Ill.
Ohio Foundry & Mfg. Co., Steubenville, Ohio.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit.
Pan-American Engineering Company, Berkeley, Calif.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
• Perfection Stove Co., Inc., Cleveland.
• Petroleum Heat & Power Co., Stamford, Conn.
Preferred Utilities Mfg. Corp., New York City.
Quaker Manufacturing Co., Chicago.
• Quincy Stove Mfg. Co., Quincy, Ill.
Ray Oil Burner Company, San Francisco.
Reif-Rexoil, Inc., Buffalo.
Scott-Newcomb, Inc., St. Louis.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corporation, Detroit.
• Viking Mfg. Corp., Cleveland.
Wayne Oil Burner Co., Fort Wayne, Ind.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., Bloomington, Ill.
York-Heat Div., York-Shipley, Inc., York, Pa.

HEATERS, WATER, STOKER-FIRED

• Catskill Metal Works, Inc., Catskill, N. Y.
• Gehl Bros. Mfg. Co., West Bend, Wis.
Pan-American Engineering Company, Berkeley, Calif.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.

HEATERS, WATER, STORAGE, ELECTRIC

Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Cleveland Heater Co., Cleveland.
Red Spot Electric Co., Tacoma, Wash.
Smith Corporation, A. O., Milwaukee.
Tru-Mac Mfg. Co., Reading, Mass.

HEATERS, WATER, STORAGE, GAS

• American Gas Machine Co., Albert Lea, Minn.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Clayton & Lambert Mfg. Co., Louisville Div., Louisville, Ky.
Coleman Co., Inc., Wichita, Kans.
Continental Water Heater Co., Ltd., Los Angeles.
Crane Company, Chicago.
Dahlquist Mfg. Co., Inc., Somerville, Mass.
Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
FauceHot Heater Co., La Porte, Ind.
Handley Brown Heater Co., Jackson, Mich.
Hotstream Heater Co., Cleveland.
Hoyt Heater Co., Los Angeles.
Koil-Les Heater Co., Geneva, Ill.
Lovekin Water Heater Co., Philadelphia.
Merit Water Heater Co., Compton, Calif.
Mission Water Heater Co., Los Angeles.
Mustee Heater Co., Cleveland.
Naco Manufacturing Co., Huntington Park, Calif.
Pennsylvania Range Boiler Co., Philadelphia.
Schoedinger, F. O., Columbus, Ohio.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Pan American Engineering Co., Berkeley, Calif.
Security Manufacturing Co., Kansas City.
Smith Corporation, A. O., Milwaukee.
Wayne Oil Burner Co., Fort Wayne, Ind.

HEATING COILS

See Coils, Heating

HOISTS, HAND AND POWER

American Chain Division, York, Pa.
American Engineering Co., Philadelphia.
• American Monorail Co., Cleveland (Electric)
Chester Mfg. Co., Lisbon, Ohio.
Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
• Conco Engineering Works, Mendota, Ill.
Detroit Hoist & Machine Co., Detroit.
Electro Lift, Inc., New York City.
Euclid Crane & Hoist Co., Euclid, Ohio.
Ford Chain Block Div., American Chain & Cable Co., Inc., Philadelphia.
Harnischfeger Corporation, Milwaukee.
Harrington Co., Philadelphia.
Louden Company, Fairfield, Iowa.
McCollum Hoist & Mfg. Co., Downers Grove, Ill.
• Master Electric Co., Dayton, Ohio.
Philadelphia Chain Block & Mfg. Co., Inc., Philadelphia.
Reading Chain & Block Corporation, Reading, Pa.
Richards-Wilcox Manufacturing Co., Aurora, Ill.
Robbins & Myers, Inc., Springfield, Ohio.
Shepard Niles Crane & Hoist Corporation, Montour Falls, N. Y.
Union Mfg. Co., New Britain, Conn.
Wright Manufacturing Division, American Chain & Cable Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Philadelphia.

HOODS, DRAFT, GAS

See Draft Diverters for Gas Heaters

HOSE AND FITTINGS, METAL, FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York City.
Chicago Metal Hose Corporation, Maywood, Ill.
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Everhot Products Co., Chicago, Ill.
Packless Metal Products Corp., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.
Seamless Co., Long Island City, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Zallas Brothers & Johnson, Wilmington, Del.

HOUSINGS, BLOWER

• Air Controls, Inc., Cleveland.
• Brundage Co., Kalamazoo, Mich.
• Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, Ohio.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Stamping Co., Detroit.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
• Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago.
Northern Blower Co., Cleveland.
Royal Air Conditioning Equipment Co., Alhambra, Cal.
Sandberg Co., H. J., Portland, Ore.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Torrington Mfg. Co., Torrington, Conn.
Trade-Wind Motorfans, Inc., Los Angeles.
• U. S. Air Conditioning Corp., Minneapolis.
Utica Products, Incorporated, Utica, N. Y.
• Viking Air Conditioning Corp., Cleveland.

HOUSINGS, FAN, PROPELLER

Circulators & Devices Mfg. Corp., New York
Commercial Shearing & Stamping Co., Youngstown, Ohio, (Venturi type)
Dahlstrom Metallic Door Co., Jamestown, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Northern Blower Co., Cleveland.

HUMIDIFIER FITTINGS

See Fittings, Humidifier, Water Line

HUMIDIFIER VALVES

See Valves, Humidifier, Water Level

HUMIDIFIERS, FURNACE, EVAPORATION, AUTOMATIC

Agricola Furnace Co., Inc., Gadsden, Ala.
American Air Conditioning Co., Minneapolis.
• Automatic Humidifier Co., Cedar Falls, Ia.
• Badger Corporation, Milwaukee.
Barclay, Inc., Robert, Chicago.
Bard Manufacturing Company, Bryan, Ohio.
Cary Mfg. Co., Waupaca, Wis.
Chandler Co., Cedar Rapids, Ia.
• Cleveland Humidifier Co., Cleveland.
Glasby Manufacturing Company, Inc., J. P., Belleville, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Ideal Furnace Co., Detroit, Mich.
Iowa Foundry Co., Sioux City, Ia.
Kraker, Henry, Holland, Mich.
Little Burner Co., Inc., H. C., San Rafael, Calif.
• McDonnell & Miller, Chicago.
• Maid-O'-Mist, Inc., Chicago.
Marshall Furnace Co., Marshall, Mich.
• Mayflower Air-Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
• Mueller Furnace Co., L. J., Milwaukee, Wis.
Nugent Furnaces, Thomas, New York City.
• Olsen Manufacturing Co., C. A., Elyria, Ohio.
• Patten Co., J. V., Syracuse, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pfening Co., Fred D., Columbus, Ohio.
• Premier Furnace Co., Dowagiac, Mich.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Skilbeck Mfg. Co., Kenosha, Wis.
• Skuttle Manufacturing Co., Detroit.
Somers, Inc., H. J., Detroit, Mich.
Thatcher Furnace Co., Garwood, N. J.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.

HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

• Air Controls, Inc., Cleveland.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

American Foundry & Furnace Co., Bloomington, Ill.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Binks Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Cleveland.
Electric Sprayit Company, Sheboygan, Wis.
Handelan Washed Air Co., Minneapolis.
Hubbard Company, Minneapolis.
• Mayflower Air-Conditioners, Inc., St. Paul.
• Meyer Furnace Co., Peoria, Ill.
Somers, Inc., H. J., Detroit, Mich.
Spraying Systems Company, Chicago.
Supreme Electric Products Corp., Rochester, N. Y.
Thatcher Furnace Co., Garwood, N. J.

HUMIDIFIERS, UNIT, ROOM TYPE (Without Heating)

Bahnson Co., Winston-Salem, N. C.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Comfort Products Corporation, Harvey, Ill.
Handelan Washed Air Co., Minneapolis.
Kauffman Air Conditioning Corp., St. Louis.
Lion Mfg. Corp., Chicago.
Marley Company, Kansas City, Kansas.
Norwood Filtration Co., The, Florence, Mass.
Pfening Company, Fred D., Columbus, Ohio. (Industrial)
Skilbeck Mfg. Co., Kenosha, Wis.
Somers, Inc., H. J. Detroit.
Standard Engineering Works, Pawtucket, R. I.
Steamair Co., Cincinnati, Ohio.
• U. S. Air Conditioning Corp., Minneapolis.

HUMIDISTATS

American Moistening Co., Providence, R. I.
Au-Temp-Co., Corp., New York City.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Friez Instrument Division, Towson, Md. (Human Hair)
H-B Instrument Co., Inc., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis. (Wood, Hair, Membrane)
• Minneapolis-Honeywell Regulator Co., Minneapolis (Human hair)
Parks-Cramer Co., Fitchburg, Mass.
• Penn Electric Switch Co., Goshen, Ind.
Powers Regulator Co., Chicago.
Sarcotherm Controls, Inc., Chicago.
Standard Engineering Works, Pawtucket, R. I.
Tagliabue Div., C. J., Brooklyn.

HUMIDITY CONTROLS

See Humidistats

HUMIDITY RECORDERS

See Recorders, Humidity

HYGROMETERS

American Moistening Co., Providence, R. I.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia.
Eimer & Amend, New York City.
Fee and Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
General Scientific Equipment Co., Philadelphia.
H. B. Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
International Moistening Co., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia. (Recording)
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Thermometers, Inc., Cincinnati.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer and Instrument Co., Philadelphia.
Scientific Instrument Co., Detroit.
Standard Thermometer, Inc., Boston.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
Weksler Thermometer Corp., New York City.

INDICATORS, SOUND LEVEL

General Electric Co., Schenectady, N. Y.

INSULATING CEMENT

See Cement, Insulating

INSULATING WINDOWS, HEAT

See Windows, Heat Insulating

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago. (Rockwool)
Air-O-Cell Industries, Inc., Detroit.
AleXite Engineering Co., Colorado Springs, Colo. (Mineral)
Alfol Insulation Co., Inc., New York City. (Blanket)
Alton Mineral Wool Insulation Co., Alton, Ill.
Aluminum Company of America, Pittsburgh. (Reflective foil)
American Hair & Felt Co., Chicago. (Hair)
Armstrong Cork Co., Lancaster, Pa. (Cork)
Bache & Co., Semon, New York City. (Glass)
Baldwin-Hill Co., Trenton, N. J. (Rockwool)
Barrett Division, Allied Chemical & Die Corporation, New York City. (Tar felt and rockwool)
Blocksom & Company, Michigan City, Ind.
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Cincinnati, O. (Rockwool)
Carney Rockwool Co., Mankato, Minn. (Granulated, Loose, and Batt)
Celotex Corp., Chicago.
Chamberlin Company of America, Detroit. (Rock Wool)
Coast Insulating Corp., Los Angeles. (Rockwool Batts, Fill)
Cork Import Corp., New York City. (Corkboard, Mineral Wool Board)
Cork Insulation Co., New York City. (Cork)
Doheny Co., John J., Belmont, Mass. (Blanket)
Dry-Zero Corporation, Chicago. (Blanket and Bound Batt)
Eagle-Picher Co., Cincinnati, O. (Mineral Wool)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fir-Tex Insulating Board Co., St. Helens, Ore. (Wood fibreboard)
Flintkote Co., New York City. (Fibre board and rockwool)
Ford Roofing Products Co., Chicago. (Board and rockwool)
General Insulating Products Co., Brooklyn, N. Y.
Hinde & Dauch Paper Co., Sandusky, O. (Air-Cell)
Hogan & Co., Inc., C. T., New York (reflective)
Insul-Wool Insulation Corp., Wichita, Kansas.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis. (Wood fibre)
International Vermiculite Co., Girard, Ill. (Loose fill)
Jiffy Manufacturing Co., Hillside, N. J. (Blanket)
Johns-Manville, New York City. (Rock wool, fibre board)
Johnston Tin Foil & Metal Co., St. Louis. (Paper backed foil)
Keasbey & Mattison Co., Ambler, Pa.
Keasbey Co., Robert A., New York City. (Rock wool)
Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
Ludowici-Celadon Co., Chicago. (Wool)
Masonite Corp., Chicago. (Blankets)
Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)
Multi-Cell Sales Corp., Minneapolis (Quilted Newspaper Blanket)
Mundet Cork Corp., Brooklyn, N. Y. (Cork)
Munn and Steele, Inc., Newark, N. J. (Vermiculite)
National Gypsum Co., Buffalo, N. Y. (Rock Wool and Board)
Nelson Mfg. Co., B. F., Minneapolis (Vermiculite)
Owens-Corning Fiberglas Corporation, Toledo. (Board and Blanket)
Pacific Lumber Co., San Francisco. (Loose fill)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Pittsburgh Plate Glass Co., Pittsburgh. (Cellular Glass)
Plant Rubber & Asbestos Works, Inc., San Francisco.
Plastergon Wall Board Co., Buffalo. (Mineral Wool and Rigid Board)
Poe Co., C. W., Cleveland. (Mineral Wool)
Refractory & Insulation Corp., New York City. (Mineral wool, loose granulated)
Reynolds Metals Co., Richmond, Va. (Reflective)
Riverton Lime & Stone Co., Inc., Riverton, Va. (Mineral Wool)
Robinson Insulation Co., Great Falls, Mont. (Loose Fill)
Rock Fleece Co., El Paso, Texas. (Fill)
Ruberoid Co., New York City. (Rock wool)
Samson Plaster Board Co., Buffalo. (Fill, batts, blankets, foil, board)
Silvercote Products, Inc., Chicago. (Reflective fabric)
Sisalkraft Co., Chicago (Reflective)
Specialty Converters, Inc., East Braintree, Mass. (Reflective)
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago. (Asbestos, hair-felt)
Standard Lime & Stone Co., Baltimore, Md. (Rock wool)
Standard Rolling Mills, Incorporated, Brooklyn. (Reflective)
Tennessee Products Corp., Nashville, Tenn. (Mineral Wool)
Therminsul Corp. of America, Kalamazoo, Mich. (Batts, bulk, granulated)
Truscon Steel Co., Youngstown, O. (Board between metal sheets)
United Cork Companies, Kearney, N. J.
United States Gypsum Co., Chicago, Ill. (Wool and board)
United States Mineral Wool Co., Chicago (Mineral Wool)
U. S. Rock Wool Co., Salt Lake City. (Granulated, Batt and Blanket)
Universal Gypsum & Lime Co., Chicago. (Loose fill)
Universal Zonolite Insulation Co., Chicago. (Loose Fill, Plaster)
Waukesha Lime & Stone Co., Waukesha, Wis. (Rock Wool batts and bulk)
Western Mineral Products Co., Omaha, Nebr. (Fill)
Western Rock Wool Corp., Huntington, Ind. (Fill)
Wilson & Co., Inc., Chicago, Ill. (Flexible, Blanket, Board)
• Wilson, Inc., Grant, Chicago, Ill. (Rock Wool)
Wood Conversion Co., St. Paul, Minn. (Board and blanket)

INSULATION, DUCT, SOUND DEADENING

American Hair & Felt Co., Chicago, Ill. (Hair Felt)
Baldwin-Hill Company, Trenton, N. J. (Rockwool, block)
Barrett Division, Allied Chemical & Die Corporation, New York.
Cabot, Inc., Samuel, Boston.
Celotex Corp., Chicago.
Eagle-Picher Co., Cincinnati.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Co., Boston.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.

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Johns-Manville, New York
Keasbey Co., Robert A., New York.
Kimberly-Clark Corp., Neenah, Wis.
Mortell Co., J. W., Kankakee, Ill. (Adhesive)
Owens-Corning Fiberglas Corporation, Toledo. (Board and Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco.
Reynolds Metals Co., Richmond, Va.
Telsit Insulation Co., Bronx, N. Y. (Plastic)
United States Rubber Co., New York City.
Universal Zonolite Insulation Co., Chicago. (Cement)
Western Felt Works, Chicago.
Western Silicair Products, Inc., Burbank, Cal.
• Wilson, Inc., Grant, Chicago.

INSULATION, DUCT, THERMAL

Acme Asbestos Covering & Flooring Co., Chicago.
Air-O-Cel Industries, Inc., Detroit.
Alfol Insulation Co., Inc., New York City. (Aluminum foil)
American Hair & Felt Co., Chicago.
Armstrong Cork Co., Lancaster, Pa.
Baldwin-Hill Co., Trenton, N. J. (Blanket)
Barrett Division, Allied Chemical & Die Corporation, New York City. (Rock Wool)
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Ohio.
Celotex Corp., Chicago.
Cork Import Corp., New York City. (Corkboard)
Cork Insulation Co., Inc., New York City. (Cork)
Dry-Zero Corporation, Chicago.
Eagle-Picher Co., Cincinnati, O. (Mineral Wool, block, blanket)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Co., Boston.
Fir-Tex Insulating Board Co., St. Helens, Ore.
General Insulating Products Co., Brooklyn.
Goodrich Company, B. F., Akron, Ohio.
Hinde & Dauch Paper Co., Sandusky, Ohio.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis
International Vermiculite Co., Girard, Ill. (Block)
Johns-Manville, New York City.
Keasbey Co., Robert A., New York City.
Keasbey & Mattison Co., Ambler, Pa. (85% Magnesia—Pipe and Blocks)
Keystone Asphalt Products Co., Chicago.
Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
LaClede-Christy Clay Products Co., St. Louis, Mo.
Masonite Corporation, Chicago.
Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., Brooklyn. (Cork)
Munn and Steele, Inc., Newark, N. J. (Plastic)
National Gypsum Co., Buffalo. (Rock Wool)
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Owens-Corning Fiberglas Corp., Toledo. (Board and Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Pittsburgh Corning Corporation, Pittsburgh. (Block)
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Cellular Glass)
Plant Rubber & Asbestos Works, Inc., San Francisco.
Poe Co., C. W., Cleveland.
Quigley Co., Inc., New York City.
Refractory & Insulation Corp., New York City. (Inside Duct Lining).
Reynolds Metals Co., Richmond, Va.
Robinson Insulation Co., Great Falls, Mont.
Rock Fleece Co., El Paso, Tex.
Ruberoid Co., New York City. (Cellular).
• Sall Mountain Co., Chicago.
Schundler & Co., Inc., F. E., Joliet, Ill.
Smith & Kanzler Corp., Elizabeth, N. J. (Asbestos Air Cell)
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago.
Telsit Insulation Co., Bronx, New York City.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United Cork Companies, Kearney, N. J.
United States Mineral Wool Co., Chicago. (Mineral Wool)
Universal Zonolite Insulation Co., Chicago. (Cement and Blocks)
Virginia Rubatex Div., Great American Industries, Inc., Bedford, Va.
Western Felt Works, Chicago.
Wilson & Co., Inc., Chicago. (Flexible, fire resisting)
• Wilson, Inc., Grant, Chicago.
Wood Conversion Co., St. Paul, Minn.

INSULATION, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago. (Asbestos, Rockwool)
Alfol Insulation Co., Inc., New York City.
Baldwin-Hill Co., Trenton, N. J. (Rock Wool Block & Cement)
Carey Co., Philip, Lockland, Ohio.
Coast Insulating Corp., Los Angeles. (Rock Wool Cement)
Eagle-Picher Co., Cincinnati, O. (Blocks)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Green Fire Brick Co., A. P., Mexico, Mo. (Vermiculite)
International Vermiculite Co., Girard, Ill. (Block Cement)
Johns-Manville, New York City. (85% Magnesia).
Keasbey Co., Robert A., New York (Asbestos)
Krehbiel Co., J. H., Chicago. (Boiler and Breech Covering)
LaClede-Christy Clay Products Co., St. Louis. (Cement and Blocks)
Ludowici-Celadon Co., Chicago. (Fire Brick)
Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)
Munn and Steele, Inc., Newark, N. J. (Bonding, Castable)
Nelson Mfg. Co., B. F., Minneapolis.
Norristown, Magnesia & Asbestos Co., Norristown, Pa.
Owens-Corning Fiberglas Corp., Toledo, O. (Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco. (Asbestos)
Plibrico Jointless Firebrick Co., Chicago. (Mineral Wool)
Quigley Company, Inc., New York City.
Refractory & Insulation Corp,, New York City. (Block Blanket).
Robinson Insulation Co., Great Falls, Mont. (High Temperature Cement)
Ruberoid Co., New York City. (Blocks, Asbestos Cement).
Schundler & Co., Inc., F. E., Joliet, Ill.
Smidth & Co., F. L., New York City.
Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.
Telsit Insulation Co., Bronx, N. Y.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United States Mineral Wool Co., Chicago.
Universal Zonolite Insulation Co., Chicago. (Cement, Bricks and Blocks)
• Wilson, Inc., Grant, Chicago.

KITCHEN FANS

See Fans, Kitchen

LACQUERS

See Enamels and Lacquers

LAMPS, STERILIZING, FOR DUCT INSTALLATION

General Electric Co., Cleveland.

LEADER STRAPS

See Fittings and Accessories, Conductor

LIFTS, SKYLIGHT

Biersach & Niedermeyer Company, Milwaukee.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Danzer Metal Works Co., Hagerstown, Md.
Dayton Greenhouse Mfg. Co., Dayton, Ohio.
• Levow, David, New York City. (Gearing)
Main Cornice Works, Los Angeles.
Park City Cornice Works, Inc., Bridgeport, Conn.
Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Van Noorden Co., E., Boston.
Weiss & Co., H., New York City.

LININGS, CHIMNEY

Condensation Engineering Co., Chicago.

LINKS, FUSIBLE

Grinnell Co., Inc., Providence, R. I.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Steffens-Amberg Co., Newark, N. J.
Westinghouse Electric, East Pittsburgh, Pa.

LOUVRES AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

• Air Conditioning Products Co., Detroit. (Motor Operated)
• Air Control Products, Inc., Coopersville, Mich. (Attic and roof Ventilators)
• Air Controls, Inc., Cleveland.
Air Conditioning Products Co., Detroit.
Airecon Industries Incorporated, Detroit.
Airmaster Corp., Chicago.
Allen Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, Ohio.
Ames Co., W. R., San Francisco.
Arex Co., Chicago.
Barber-Coleman Company, Rockford, Ill.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Biersach & Niedermeyer Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
Buffalo Forge Co., Buffalo.
Burt Mfg. Co., Akron, Ohio.
Campbell Heating Co., E. K., Kansas City, Mo.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Chicago Metal Mfg. Co., Chicago.
Circulators & Devices Mfg. Corp., New York City.
Clay Equipment Corp., Cedar Falls, Ia.
Controlair Manufacturing Co., Los Angeles.
Decatur Iron & Steel Co., Decatur, Ala.
Dual-Air Fan Corporation, Chicago.
Electrovent Fan & Mfg. Co., Chicago.
• Elgo Shutter & Mfg. Co., Detroit.

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Firecraft Corporation, Chicago (Stationary)
Gillian Mfg. Co., Detroit.
Guth Co., Edwin F., St. Louis.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
International Engineering, Inc., Dayton, Ohio.
International Steel Company, Evansville, Ind.
Jamieson Mfg. Co., Dallas, Tex.
Johnson Fan & Blower Corp., Chicago.
Johnston Co., Wm. W., Dayton, Ohio.
Jordan & Co., Paul R., Indianapolis.
Kelvin-White Co., Boston.
King Ventilating Co., Owatonna, Minn.
Kirk & Blum Mfg. Co., Cincinnati.
Klee Co., George B., Cincinnati.
• Lau Blower Co., Dayton, O.
Leslie Welding Co., Chicago.
Lockjoint Wood Products Co., Wichita, Kan. (Wood; stationary door, wall, window and ceiling)
Martin Fan & Blower Co., Chicago.
Maysteel Products, Inc., Milwaukee.
Meier Electric & Machine Co., Indianapolis.
Meyer Mfg. Co., Detroit.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Myers Electric Co., Pittsburgh.
• Nelson Corporation, Herman, Moline, Ill.
Overly Manufacturing Co., Greensburg, Pa.
Peerless Electric Co., Warren, Ohio.
Reed Unit-Fans, Inc., New Orleans.
Richmond Fireproof Door Company, Richmond, Ind.
Riggin Metal Products, Kankakee, Ill.
Robertson Co., H. H. Pittsburgh.
Schoedinger, F. O., Columbus, Ohio.
Signal Electric Mfg. Co., Menominee, Mich.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Standard Stamping & Perforating Co., Chicago.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trade-Wind Motorfans, Inc., Los Angeles.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.
Utility Appliance Corporation, Los Angeles.
Van Noorden Co., E., Boston.
Victor Electric Products, Inc., Cincinnati.
• Waterloo Register Co., Waterloo, Ia.

MACHINERY, REBUILT AND USED

Biggs Supply Co., B. C., Lincoln, Nebr.
Brooks Co., Inc., B. R., Boston.
• Central-West Machinery Co., Chicago.
General Blower Co., Morton Grove, Ill.
Hyman & Sons, Joseph, Philadelphia.
• Interstate Machinery Co., Inc., Chicago.
Maplewood Machinery Co., Chicago.
• Milton Equipment Co., Philadelphia.
Osborn Co., J. M. & L. A., Cleveland.
• Potts, Sons & Co., Inc., W. F., Philadelphia.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
St. Louis Tool Co., St. Louis.

MACHINES, BAR FOLDERS, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis.

MACHINES, BAR FOLDERS, POWER

• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, BEADING, HAND

• Barth Mfg. Co., Milldale, Conn.
Kraus Mfg. Co., Charles E., Louisville, Ky.
• Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio.
• Peck, Stow & Wilcox Co., Southington, Conn.
Robertson, F. L., Buffalo.

MACHINES, BEADING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Swain Mfg. Co., Fred J., St. Louis.
Yoder Co., Cleveland.

MACHINES, BURRING, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, BURRING, POWER

Cincinnati Electrical Tool Co., The, Cincinnati.
• Independent Pneumatic Tool Co., Chicago.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Stow Manufacturing Co., Binghamton, N. Y.
Yoder Co., Cleveland.

MACHINES, CLEAT BENDING, HAND

• Smith, R. E., Waukegan, Ill.

MACHINES, COMBINATION, HAND
(Beading, Burring, Turning, Wiring, etc.)

• Barth Mfg. Co., Milldale, Conn.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio. (Beading—Rotary Snips)
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, COMBINATION, POWER
(Beading, Burring, Turning, Wiring, etc.)

Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Wysong & Miles Co., Greensboro, N. C.

MACHINES, CRIMPING, HAND

• Barth Mfg. Co., Milldale, Conn.
C-B Tool Co., Lancaster, Pa.
Kraus Mfg. Co., Charles E., Louisville, Ky.
• Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, Ohio.
• Peck, Stow & Wilcox Co., Southington, Conn.
Service Machine Co., Elizabeth, N. J.

MACHINES, CRIMPING, POWER

Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, Ohio.

MACHINES, DIMPLING, ELECTRIC

York Electric Tool Co., York, Pa.

MACHINES, DOUBLE SEAMER, ROOF, POWER

Maxfield Manufacturing Co., Temple, Tex.
• Niagara Machine & Tool Works, Buffalo.
Streine Tool & Mfg. Co., New Bremen, Ohio.

MACHINES, ELBOW, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, ELBOW, POWER

Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, FILING

Air-Speed Tool Co., Los Angeles. (Pneumatic)
DoAll Company, Des Plaines, Ill.
DoAll Company, Minneapolis.
Ideal Commutator Dresser Co., Sycamore, Ill. (Rotary)

MACHINES, FLANGING, HAND

• Barth Mfg. Co., Plantsville, Conn.
Excelsior Tool & Machine Co., East St. Louis, Ill.
• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
"Original" Metal Flanging Machine Works, Seattle, Wash.
Packham Crimper Co., Mechanicsburg, Ohio.
• Peck, Stow & Wilcox Co., Southington, Conn.
Ward Machinery Co., Chicago.
Weiss & Co., H., New York.

MACHINES, FLANGING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works Co., Cleveland.
• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Riverside Machinery Company, Chicago.
Swain Mfg. Co., Fred J., St. Louis.
Whiting Corp., Harvey, Ill.

MACHINES, GROOVING, HAND

• Barth Mfg. Co., Milldale, Conn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, GROOVING, POWER

• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, GUTTER FORMING, HAND

• Kane & Roach, Inc., Syracuse, N. Y.
Robertson, F. L., Buffalo.

MACHINES, NIBBLING, HAND

National Machine Tool Co., Racine, Wis.
• Skilsaw, Inc., Chicago

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MACHINES, NIBBLING, POWER

Campbell, Andrew C., Div. of American Chain & Cable Co., Inc., Bridgeport, Conn.
• Independent Pneumatic Tool Co., Chicago. (Portable)
Kling Bros. Engineering Works, Chicago.
• Libert Machine Co., Green Bay, Wis.
St. Louis Tool Co., St. Louis.
Savage Co., W. J., Knoxville, Tenn.
Service Machine Co., Elizabeth, N. J.

MACHINES, PIPE, LOCK FORMING, POWER

• Kane & Roach, Inc., Syracuse, N. Y.
• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.

MACHINES, PITTSBURGH LOCK FORMING

• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.
Rafter Machine Co., Belleville, N. J.
• Riverside Machinery Co., Chicago.

MACHINES, PITTSBURGH LOCK OPENERS

Atlas Machine & Tool Co., Portland, Ore.
Maplewood Machinery Co., Chicago.

MACHINES, ROLL FORMING, POWER

(For Mouldings and Shapes)

• Dahlstrom Machine Works, Chicago.
• Kane & Roach, Inc., Syracuse, N. Y.
Tishken Products, Detroit.
Maplewood Machinery Co., Chicago.
Yoder Company, Cleveland.

MACHINES, ROLLING, CRIMPING, BEADING, POWER

Kling Bros. Engineering Works, Chicago.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SEAMING, HAND

• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York.

MACHINES, SEAMING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
• Lockformer Co., Chicago.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, Ohio.
Swain Mfg. Co., Fred J., St. Louis.

MACHINES, SETTING DOWN, HAND

• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SETTING DOWN, POWER

Callahan Can Machine Co., Inc., Brooklyn.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SLIP ROLL FORMING, HAND

• Barth Mfg. Co., Millidale, Conn.
Bertsch & Co., Cambridge City, Ind.
Hendley & Whittemore Co., Beloit, Wis.
• Milton Equipment Co., Philadelphia.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Riverside Machinery Co., Chicago.
Wysong & Miles Co., Greensboro, N. C.

MACHINES, SLIP ROLL FORMING, POWER

Bertsch & Co., Cambridge City, Ind.
• Dahlstrom Machine Works, Chicago.
Hendley & Whittemore Co., Beloit, Wis.
Maplewood Machinery Co., Chicago.
• Milton Equipment Co., Philadelphia.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Wysong & Miles Co., Greensboro, N. C.
Yoder Co., Cleveland.

MACHINES, SLITTING, HAND

• Barth Mfg. Co., Millidale, Conn.
Bertsch & Co., Cambridge City, Ind.
• Beverly Shear Co., Chicago.
Buffalo Forge Co., Buffalo.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
Service Machine Co., Elizabeth, N. J.
Ward Machinery Co., Chicago.
• Whitney Metal Tool Co., Rockford, Ill.

MACHINES, SLITTING, POWER

Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Toledo, Ohio.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Hendley & Whittemore Co., Beloit, Wis.
• Kane & Roach, Inc., Syracuse, N. Y.
• Libert Machine Co., Green Bay, Wis. (Rotary)
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
St. Louis Tool Co., St. Louis.
Streine Tool & Mfg. Co., New Bremen, Ohio.
• Whiting Corp., Harvey, Ill.
Yoder Co., Cleveland.

MACHINES, SQUARING, POWER

Bertsch & Co., Cambridge City, Ind.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, Ohio.
• Whitney Metal Tool Company, Rockford, Ill. (Shear)
Wysong & Miles Co., Greensboro, N. C.

MACHINES, WIRING, HAND

• Barth Mfg. Co., Millidale, Conn.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, WIRING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works, Co., Cleveland.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Yoder Co., Cleveland.

MALLETS, METAL WORKING

Allen, Inc., Charles I., Pequabuck, Conn. (Hickory and Lignum Vitae)
Bernz Company, Otto, Rochester, N. Y. (Dogwood)
Bersted Co., Martin, Chicago, Ill (Molded composition)
Chicago Rawhide Mfg. Co., Chicago, Ill.
Densewood Corporation, Elkhorn, Wis. (Wood)
Electric Materials Co., North East, Pa. (Copper)
Goodrich Company, B. F., Akron, Ohio. (Rubber)
Greene, Tweed & Co., New York City.
Lignum-Vitae Products Corp., Jersey City, N. J.
Maplewood Machinery Co., Chicago. (Wood)
New Plastic Corporation, Hollywood, Calif. (Plastic)
• Niagara Machine & Tool Works, Buffalo. (Hickory)
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Southwest Manufacturing Co., Santa Ana, Calif. (Pryalin tipped)
Stanley Tools, New Britain, Conn. (Soft face hammers)
Stossel & Sons Co., Carl, Front Royal, Va.
Warren Handle Works Co., Cortland, Ohio.

MATS, FOR EVAPORATIVE COOLERS

Adams Mattress Factory, Fort Worth, Tex.
American Excelsior Corp., Chicago.
Beckett & Co., Thomas, Dallas, Tex. (Aspen Fiber)
Eugene Excelsior Company, Eugene, Oregon.
Levy Bros. Company, Los Angeles.
• Morey, Dan, Los Angeles.
• Palmer Manufacturing Corp., Phoenix, Ariz.

METAL CEILINGS

See Ceilings, Metal

METAL HOSE

See Hose, Metal

METAL PROTECTING

See Paint, Metal Protecting

METAL SPRAY GUNS

See Guns, Spray, Metals

METAL STAMPINGS

See Stampings, Metal

METALS, PERFORATED, SHEET AND PLATE

Beckley Perforating Co., Garwood, N. J.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Perforating Co., Chicago.
Cross Engineering Co., Carbondale, Pa.
Diamond Manufacturing Co., Wyoming, Pa.
Downs-Smith Brass & Copper Co., Inc., New York City.
Erdle Perforating Co., Rochester, N. Y.
• Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
Johnston & Chapman Co., Chicago.
Littleford Bros., Inc., Cincinnati.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Mundt & Sons, Charles, Jersey City, N. J.
Nortmann-Duffke Co., Milwaukee.
Reliable Perforating Co., Chicago.

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• Revere Copper and Brass Incorporated, New York.
Rigid-Tex Corporation, Buffalo.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Stamping & Perforating Co., Chicago.
Wickwire Spencer Steel Co., New York City.

METERS, AIR VELOCITY, DIRECT READING

Detroit Air Conditioning Service Co., Inc., Detroit.
Hays Corporation, Michigar City, Ind.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.

MONORAIL SYSTEMS
(Track, Trolley, Hoist, Accessories)

• Americah Monorail Co., Cleveland.
Chicago Tramrail Co., Chicago.
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Ferdon Equipment Engineering Co., Hillside, N. J.
Louden Company, Fairfield, Iowa.
Philadelphia Tramrail Co., Philadelphia.
Reading Chain & Block Corporation, Reading, Pa.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Webb Co., Jervis B., Detroit.

MOTORS, DAMPERS, DUCT, MODULATING OR PROPORTIONING

Au-Temp-Co Corp., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Hotstream Heater Co., Cleveland.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• White Manufacturing Co., St. Paul, Minn.

MOTORS, DAMPER, DUCT, TWO-POSITION

Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Crown Controls Company, New Bremen, Ohio.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.

MOTORS, DAMPERS, FURNACE DRAFT, ELECTRICAL

Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barclay, Inc., Robert, Chicago.
• Crise Electric Mfg. Co., Columbus, Ohio.
Crown Controls Company, New Bremen, Ohio.
Defender Instrument & Regulator Co., St. Louis.
• Gleason-Avery, Inc., Auburn, N. Y.
• Janette Mfg. Co., Chicago 6.
• Mercoid Corporation, Chicago, Ill.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Division, Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

MOTORS, ELECTRIC, FRACTIONAL H. P.

Ampex Electric & Mfg. Co., San Carlos, Calif.
Baldor Electric Co., St. Louis.
Barber-Colman Co., Rockford, Ill. (A. C.)
Bodine Electric Co., Chicago.
Brown-Brockmeyer Co., Inc., Dayton, Ohio.
Canatsey Electric Mfg. Co., Kansas City, Mo.
• Century Electric Co., St. Louis.
Delco Appliance Div. General Motors Corp., Rochester, N. Y.
Delco Products Division, General Motors Corp., Dayton, Ohio.
Diehl Mfg. Co., Somerville, N. J.
Dynamic Air Engineering, Inc., Los Angeles.
Eastern Air Devices, Inc., Brooklyn.
Electric Sprayit Co., Sheboygan, Wis.
Emerson Electric Mfg. Co., St. Louis.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Holtzer-Cabot Electric Co., Boston.
Howell Electric Motors Co., Howell, Mich.
• Janette Mfg. Co., Chicago.
Leland Electric Co., Inc., Dayton, Ohio.
Marathon Electric Mfg. Corp., Wausau, Wis.
• Master Electric Co., Dayton, Ohio.
Ohio Electric Mfg. Co., Cleveland.
• Packard Electric Div., General Motors Corp., Detroit.
Peerless Electric Co., Warren, Ohio.
Redmond Co., A. G., Owosso, Mich.
Reliance Electric & Engineering Co., Cleveland.
Reynolds Electric Company, Chicago.
Robbins & Myers, Inc., Springfield, Ohio.
Russell Electric Co., Chicago.
Signal Electric Mfg. Co., Menominee, Mich.
Small Motors, Inc., Chicago.
Smith Manufacturing Co., Inc., F. A., Rochester, N. Y.
Speedway Mfg. Co., Cicero, Ill.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
U. S. Electrical Motors, Inc., Los Angeles.
Victor Electric Products, Inc., Cincinnati.
Wagner Electric Corp., St. Louis.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

MOTORS, ELECTRIC, 1 H. P. AND OVER

Allis-Chalmers Mfg. Co., Milwaukee.
Allis Co., Louis, Milwaukee.
Baldor Electric Co., St. Louis.
Bogue Electric Co., Paterson, N. J.
Brown-Brockmeyer Co., Inc., Dayton, Ohio.
Burke Electric Co., Erie, Pa.
• Century Electric Co., St. Louis.
Continental Electric Co., Inc., Newark, N. J.
Crocker-Wheeler Elec. Mfg. Co., Ampere, N. J.
Delco Products Division, General Motors Corp., Dayton, Ohio.
Diehl Mfg. Co., Somerville, N. J.
Electric Machinery Mfg. Co., Minneapolis.
Emerson Electric Mfg. Co., St. Louis.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Holtzer-Cabot Electric Co., Boston.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, Ohio.
Imperial Electric Co., Akron, Ohio.
Jackson Co., Byron, Los Angeles. (Submersible)
• Janette Mfg. Co., Chicago.
Leland Electric Co., Inc., Dayton, Ohio.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Master Electric Co., Dayton, Ohio.
Peerless Electric Co., Warren, Ohio.
Philadelphia Gear Works, Inc., Philadelphia. (Geared)
Reliance Elec. & Engr. Co., Cleveland.
Robbins & Myers, Inc., Springfield, Ohio.
Star Electric Motor Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
U. S. Electrical Motors, Inc., Los Angeles.
• Wagner Electric Corp., St. Louis.
Westinghouse Electric Corporation, East Pittsburgh.

MOTORS, TIMING

Automatic Temperature Control Co., Inc., Philadelphia.
Eastern Air Devices, Inc., Brooklyn.
Hansen Mfg. Co., Inc., Princeton, Ind.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Paragon Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.

MOULDING AND TRIM, ORNAMENTAL, for CABINETS and CASINGS

Alden Manufacturing Co., Painesville, O.
Alimetal Weatherstrip Co., Chicago.
Aluminum Co. of America, Pittsburgh.
Aluminum Goods Mfg. Co., Manitowoc, Wis.
Brasco Manufacturing Co., Harvey, Ill.
Briggs Mfg. Co., Detroit.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Mouling Div., L. A. Young Spring & Wire Corp., Detroit.
Edwards Manufacturing Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Extruded Plastics, Inc., Norwalk, Conn.
Friedley-Voshardt Co., Chicago.
Green Mfg. Co., Chicago.
Herron-Zimmers Moulding Co., Detroit.
Jamestown Metal Corp., Jamestown, N. Y.
Kawneer Co., Niles, Mich.
Ladon Co., Chicago.
• Lau Blower Co., Dayton, O.
Ledkote Products Co., Long Island City, N. Y.
Lees, John, Div. Serrick Corp., Muncie, Ind.
Maysteel Products,Inc., Milwaukee.
Miller & Doing, Brooklyn, N. Y.
Pyramid Metals Co., Chicago.
• Revere Copper & Brass, Inc., New York City.
Rigid-Tex Corporation, Buffalo.
United Metal Prod. Div., Canton, O.
United States Stoneware Co., Akron, O., and New York City.
Werner Co., Inc., R. D., New York City. (Plastic)

NAILS, ALUMINUM

Atlas Tack Corporation, Fairhaven, Mass.
Aluminum Co. of America, Pittsburgh.
Hassall, Inc., John, Brooklyn.
Maze Company, W. H., Peru, Ill.

NAILS, COPPER

American Steel & Wire Co., Cleveland.

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Angell Nail & Chaplet Co., Cleveland.
Atlas Tack Corporation, Fairhaven, Mass.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Clendenin Brothers, Inc., Baltimore.
• Columbia Steel Co., San Francisco, Calif.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Copperweld Steel Co., Glassport, Pa.
Downs-Smith Brass & Copper Co., New York City.
Grammes & Sons, Inc., L. F., Allentown, Pa.
Hassall, Inc., John, Brooklyn.
• Hussey & Co., C. G., Pittsburgh.
Maze Co., W. H., Peru, Ill.
Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, HARDENED MASONRY

American Steel & Wire Co., Cleveland.
Hillwood Manufacturing Co., Cleveland. (Concrete Pinsors)
• Parker-Kalon Corp., New York City.
Rawlplug Co., Inc., New York City.
Tremont Nail Co., Wareham, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

NAILS, ROOFING

American Steel & Wire Co., Cleveland.
Angell Nail & Chaplet Co., Cleveland.
Atlas Tack Corporation, Fairhaven, Mass.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
• Columbia Steel Co., San Francisco.
Conklin Brass & Copper Co., Inc., T. E., New York City. (Copper)
Continental Steel Corp., Kokomo, Ind.
Deniston Co., Chicago.
Dickson Weatherproof Nail Co., Evanston, Ill. (Lead headed).
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Hassall, Inc., John, Brooklyn.
• Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
• Republic Steel Corp., Cleveland.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Turner & Seymour Mfg. Co., Torrington, Conn.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

NAILS, SCREW, HARDENED

American Steel & Wire Co., Cleveland.
Dickson Weatherproof Nail Co., Evanston, Ill.
Hillwood Manufacturing Co., Cleveland. (Drive)
Industrial Screw Company, Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
• Parker-Kalon Corp., New York City.
• Republic Steel Corp., Cleveland.

NAILS, STAINLESS STEEL

American Steel & Wire Co., Cleveland.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Hassall, Inc., John, Brooklyn.
Maze Co., W. H., Peru, Ill.
• Republic Steel Corp., Cleveland, O.
Tremont Nail Co., Wareham, Mass.
Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, ZINC COATED

American Steel & Wire Co., Cleveland.
American Zinc Products Co., Greencastle, Ind.
Angell Nail & Chaplet Co., Cleveland.
Atlas Tack Corporation, Fairhaven, Mass.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
• Columbia Steel Co., San Francisco.
Continental Steel Corp., Kokomo, Ind.
Dickson Weatherproof Nail Co., Evanston, Ill.
Grammes & Sons, Inc., L. F., Allentown, Pa.
Hassall, Inc., John, Brooklyn.
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
• Republic Steel Corp., Cleveland.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tremont Nail Co., Wareham, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

NAME PLATES

See Hardware, for Cabinets and Casings

NIBBLERS

See Machines, Nibbling

NIGHT AIR FANS

See Fans, Night Air Cooling

NOZZLES, SPRAY, WATER

American Cooling Tower Co., Kansas City, Mo.
April Showers Co., Washington, D. C. (Roof Ceiling)
Bahnson Co., Winston-Salem, N. C.
Balloffet Dies & Nozzle Co., Inc., Guttenberg, N. J.
• Bayley Blower Co., Milwaukee.
Benjamin Air Rifle Co., St. Louis.
Binks Mfg. Co., Chicago.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Chain Belt Co., Milwaukee.
• Clarage Fan Co., Kalamazoo, Mich.
• Delavan Engineering Co., Des Moines, Ia.
DeVilbiss Co., Toledo, O.
Eclipse Air Brush Co., Inc., Newark, N. J.
Electric Sprayit Co., Sheboygan, Wis.
Hubbard Co., Minneapolis.
International Moistening Co., Providence, R. I.
Link-Belt Co., Chicago.
Marley Co., Kansas City, Kan.
Martocello & Co., Jos. A., Philadelphia.
Monarch Mfg. Works, Inc., Philadelphia.
National Engineering & Manufacturing Co., Kansas City, Mo.
Phillips Cooling Tower Co., Inc., New York City.
Parks-Cramer Co., Fitchburg, Mass.
Plummer Spray Equipment Co., Napoleon, Ohio.
Rega Mfg. Co., Rochester, N. Y.
Ross Heater & Mfg. Co., Inc., Buffalo.
Ross Sprinkler Co., Pasadena, Calif.
Ruppright, Siegfried, Los Angeles. (Roof Cooling)
Skinner Irrigation Co., Troy, Ohio.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Chicago.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Div., Westinghouse Electric, Boston.
Supreme Electric Products Corp., Rochester, N. Y.
Thermal Industries, Indio, Calif.
Water Cooling Corp., New York City.
Water Cooling Equipment Corp., St. Louis.
Yarnall-Waring Co., Philadelphia.

NUTS, SHEET METAL

Kaynar Manufacturing Co., Los Angeles.
Tinnerman Products, Inc., Cleveland.

ODOR ADSORBERS

See Adsorbers, Odor

OFFSETS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

OIL BURNERS

See Burners, Oil

OIL FILTERS

See Fittings and Accessories, Oil Burner

ORNAMENTS, SHEET METAL

See Mouldings and Trim, Ornamental

OXY-ACETYLENE WELDING EQUIPMENT

See Welding Equipment, Oxy-Acetylene

OZONE APPARATUS

A & J Co., Chicago.
Automatic Pump & Softener Corp., Rockford, Ill.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Coroaire Heater Corp., Cleveland.
Electroaire Corp., Chicago.
Montgomery Bros., San Francisco.
Norwood Filtration Co., The, Florence, Mass.
Ozone Air Co., Grand Rapids, Mich.
Sealkote Corp., Chicago.
United States Ozone Co. of America, Scottdale, Pa.

PAINT, ALUMINUM

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
• Allen Co., Inc., L. B., Chicago.
Aluminum Co. of America, Pittsburgh.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carter Paint Co., Liberty, Ind.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
Dragert Co., Inc., C. H., Brooklyn.
du Pont de Nemours & Co., E. I., Wilmington, Del.
• Elaterite Non-Metallic Products Co., Los Angeles.

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Flood Company, Cleveland.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., Cleveland.
Goodrich Co., B. F., Akron, O.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co. Div. of Glidden Co., Chicago
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
• Illinois Bronze Powder Co., Inc., Chicago.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Inc., Pittsburgh.
Krehbiel Co., J. H., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
Midland Paint & Varnish Co., Cleveland.
National Mfg. Corp., Tonowanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg Co., N. F., Minneapolis.
O'Brien Varnish Co., South Bend, Ind.
Pittsburgh Plate Glass Co., Pittsburgh.
Presstite Engineering Co., St. Louis.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Roxalin Flexible Finishes,, Inc., Elizabeth, N. J.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony Oil Co., Inc., New York City.
Sonneborn Sons., Inc., L., New York.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
Westinghouse Electric Corp., East Pittsburgh, Pa.
Wilbur & Williams Co., Boston, Mass.

PAINT, CONCRETE, WATERPROOFING

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Die Corp., New York City
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia.
Cheesman-Elliot Co., Inc., Brooklyn.
Coddington Manufacturing Co., E. D., Milwaukee.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Eastern States Supply Co., Brooklyn.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flintkote Co., New York City.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Inc., Pittsburgh.
Lastik Products Co., Inc., Pittsburgh.
Lehon Co., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
Nebel Manufacturing Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Paint-Point Corp., Newark, N. J.
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Reilly Tar & Chemical Corp., Indianapolis.
Saverite Engineering Co., Hoboken, N. J.
Self-Vulcanizing Rubber Co., Inc., Chicago.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, Staten Island, N. Y.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
United States Gypsum Co., Chicago.
United States Stoneware Co., Akron, O., and New York City.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Wilbur & Williams Co., Boston.
Wilhelm Co., A., Reading, Pa.

PAINT, COPPER

Acme White Lead & Color Works, Detroit.
Baer Brothers, New York City.
Debeveise Co., Brooklyn.
Devoe & Raynolds Co., Inc., New York City.
Glidden Company, Cleveland.
Lucas & Co., Inc., John, Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Stokes, Jr., J. W., Brooklyn.

PAINT, CRACKLE FINISH

Acme White Lead & Color Works, Detroit.
Baer Brothers, New York City.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hilo Varnish Corp., Brooklyn.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Wattenamel Co., Summit, Ill.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, HOT SURFACES

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
• Allen Co., Inc., L. B., Chicago.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Die Corp., New York City.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Dampney Co. of America, Hyde Park, Boston.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
• Elaterite Non-Metallic Products Co., Los Angeles.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Inc., Pittsburgh.
Krehbiel Co., J. H., Chicago.
Laclede-Christy Clay Products Co., St. Louis.
Lastik Products Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
National Engineering Products, Inc., Washington, D. C.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sauereisen Cements Co., Sharpsburg, Pa.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Gutta Percha Paint Co., Providence, R. I.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Westinghouse Electric Corp., East Pittsburgh.
Wilbur & Williams Co., Boston.

PAINT, METAL PROTECTING, FINISH COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Barrett Div., Allied Chemical & Dye Corp., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., Brooklyn.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
• Elaterite Non-Metallic Products Co., Los Angeles.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Koppers Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
Midland Paint & Varnish Co., Cleveland. (Red)
National Lead Co., New York City.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
North American Fibre Products Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Inc., Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilbur & Williams Co., Boston.

PAINT, METAL PROTECTING, FINISH COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Barrett Div., Allied Chemical & Dye Corp., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., Brooklyn.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
• Elaterite Non-Metallic Products Co., Los Angeles.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Chicago.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Koppers Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
Midland Paint & Varnish Co., Cleveland. (Graphite)
National Lead Co., New York City.
Nelson Mfg. Co., B. F., Minneapolis.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Wilbur & Williams Co., Boston.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, METAL PROTECTING, PRIME COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Barrett Div., Allied Chemical & Die Corp., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Carey Mfg. Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Company, Brooklyn.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Eagle-Picher Co., Cincinnati.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flood Co., Cleveland.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Irvington Varnish & Insulator Co., Irvington, N. J.
Koppers Co., Inc., Pittsburgh.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
Midland Paint & Varnish Co., Cleveland.
National Engineering Products, Inc., Washington, D. C.
National Lead Co., New York City.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Paraffine Companies, Inc., San Francisco.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
Turco Products, Inc., Los Angeles.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilbur & Williams Co., Boston.

PAINT, METAL PROTECTING, PRIME COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Barrett Div., Allied Chemical & Die Corp., New York City.
Blue Ridge Talc Co., Inc., Henry, Va.
Carey Mfg. Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Cordo Chemical Corp., Norwalk, Conn.
Debevoise Co., Brooklyn, N. Y.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flood Co., Cleveland.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago.
Hilo Varnish Corp., Brooklyn. (Zinc Chromate)
Inter-Coastal Paint Corporation, East St. Louis, Ill.
Irvington Varnish & Insulator Co., Irvington, N. J.
Koppers Co., Inc., Pittsburgh, Pa.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
National Engineering Products, Inc., Washington, D. C.
National Lead Co., New York City.
Nelson Mfg. Co., B. F., Minneapolis. (Asphalt Base)
New Jersey Zinc Co., New York City.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Paraffine Companies, Inc., San Francisco.
Patterson-Sargent Co., Cleveland, O.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilbur & Williams Co., Boston.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, ROOFING

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.

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Acorn Refining Co., Cleveland.
American-Marietta Co., Chicago.
American Asphalt Roof Corp., Kansas City, Mo.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Die Corp., New York City. (Pitch)
Blue Ridge Talc Co., Inc., Henry, Va.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Clinton Metallic Paint Co., Clinton, N. Y. (Red Metallic and Venetian)
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O. (All Kinds)
Debevoise Co., Brooklyn.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Eastern States Supply Co., Brooklyn, N. Y.
• Elaterite Non-Metallic Products Co., Los Angeles.
Evercrete Corp., New York City.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)
Koppers Co., Pittsburgh. (Bituminous)
Krehbiel Co., J. H., Chicago.
Lastik Products Co., Inc., Pittsburgh. (Asphalt, Fibre)
Lehon Co., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Lyon, Conklin & Co., Inc., Baltimore.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland. (Fibercote)
Mortell Co., J. W., Kankakee, Ill.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
North American Fibre Products Co., Cleveland.
Ohmiac Paint & Refining Co., Chicago, Ill. (Asphalt)
Pittsburgh Plate Glass Co., Pittsburgh.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh. (Processed Asphalt)
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt. (Asphalt)
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Gutta Percha Paint Co., Providence, R. I.
United States Gypsum Co., Chicago.

PAINT SPRAY GUNS

See Guns, Spray, Paint

PAPER, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago.
Carey Co., Philip, Lockland, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Johns-Manville, New York City.
Keasbey & Mattison Co., Ambler, Pa.
Linear Packing & Rubber Co., Inc., Tacony, Philadelphia.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberoid Co., New York City.
• Sall Mountain Co., Chicago.
Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.
• Wilson, Inc., Grant, Chicago.

PARTS, for HEATING and AIR CONDITIONING EQUIPMENT

(Tank Heads and Bottoms, Water Heater Legs)

Ackermann Mfg. Co., Wheeling, W. Va. (Furnace Heads).
• Anemostat Corporation of America, New York City.
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit.
Lukens Steel Co., Coatesville, Pa.

PASTE, ASBESTOS PAPER

Acme Asbestos Covering & Flooring Co., Chicago.
Clark Stek-O Corp., Rochester, N. Y.
Lyon, Conklin & Co., Inc., Baltimore.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Rutland Fire Clay Co., Rutland, Vt.
• Sall Mountain Co., Chicago.
Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.
Western Mineral Products Co., Omaha, Nebr.
• Williamson Heater Co., Cincinnati.
• Wilson, Inc., Grant, Chicago.

PATTERNS, BLUE PRINT, ELBOWS, SKYLIGHTS and FITTINGS

• Gray, G. L., New Haven, Conn.

PERFORATED METAL

See Metals, Perforated, Sheet and Plate

PILLOW BLOCKS

See Bearings, Pillow Block

PIPE, CONDUCTOR

• American Rolling Mill Co., Middletown, Ohio.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
• Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Manufacturing Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.
• Hussey & Co., C. G., Pittsburgh. (Copper)
Klauer Manufacturing Co., Dubuque, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
• Milcor Steel Co., Milwaukee.
Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Obdyke, Inc., B. P., Philadelphia.
Osborn Co., J. M., & L. A., Cleveland.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
St. Paul Corrugating Co., St. Paul, Minn.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Tiffin Art Metal Co., Tiffin, Ohio.
Tri-State Heating Supply Co., Fort Wayne, Ind.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.
York Corrugating Co., York, Pa.

PIPE, FURNACE

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• American Rolling Mill Co., Middletown, Ohio.
Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines.
Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
• International Heater Co., Utica, N. Y.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y.
Keith Furnace Co., Des Moines, Ia.
La Crosse Steel Roofing & Corrugating Co, La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.
• Majestic Co., Huntington, Ind.
Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
Maple City Furnace Co., Monmouth, Ill.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
Olsen Manufacturing Co., C. A., Elyria, O.
Osborn Co., J. M., & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
• Payne Furnace Co., Beverly Hills, Calif.
• Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Specialty Co., Pittsburgh.
Sioux Steel Co., Sioux Falls, S. D.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.

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Stratton & Terstegge Co., Louisville, Ky.
Superior Products Co., Omaha, Nebr.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Wheeling Corrugating Co., Wheeling, W. Va.
• Williamson Heater Co., Cincinnati.
• Williams-Wallace Co., San Francisco.

PIPE, SMOKE

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
• American Rolling Mill Co., Middletown, Ohio.
Bieler & Son, L., Long Island City, N. Y.
Biersach & Niedermeyer Co., Milwaukee.
Bovee Furnace Works, Waterloo, Ia. (Cast Iron)
Braden Mfg. Co., Terre Haute, Ind.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Champion Furnace Pipe Co., Peoria, Ill.
• Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Galva Heater Co., Galva, Ill. (Cast Iron)
Green Colonial Furnace Co., Des Moines, Ia.
Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
• International Heater Co., Utica, N. Y.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y.
Keith Furnace Co., Des Moines, Ia.
• Krauser-Boyd, Inc., North Tonawanda, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lennox Furnace Co., Marshalltown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.
• Made-Rite Furnace Pipe & Fittings Co., Newport, Ky.
• Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
• Meyer & Bro. Co., F., Peoria, Ill.
• Milcor Steel Co., Milwaukee.
• Mueller Furnace Co., L. J., Milwaukee.
• Olsen Manufacturing Co., C. A., Elyria, Ohio.
Osborn Co., J. M. & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Patten Co., J. V., Sycamore, Ill.
• Patten Co., J. V., Sycamore, Ill.
Portland Stove Foundry Co., Portland, Me.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Ster-Na-Man Foundry Co., Springfield, Ill. (Cast Iron)
Stratton & Terstegge Co., Louisville, Ky.
Superior Products Co., Omaha, Nebr.
Tri-State Heating Supply Co., Fort Wayne, Ind.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Wheeling Corrugating Co., Wheeling, W. Va.
Wilder Manufacturing Co., Niles, O.
• Williamson Heater Co., Cincinnati.
• Williams-Wallace Co., San Francisco.
• Wise Furnace Co., Akron, O.

PIPE LOCK FORMERS

See Machines, Pipe, Lock Forming

PIPE & FITTINGS, GAS VENT AND FLUE

Baltimore Enamel & Novelty Co., Baltimore. (Porcelain Enamel, Aluminum and Galvanized Iron)
• Char-Gale Mfg. Co., Minneapolis. (Blue and Galvanized)
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• Condensation Engineering Corp., Chicago. (Vitreous Enamel)
Heremetal Co., Minneapolis. (Heresite Coated)
Johns-Manville, New York City.
Laclede Steel Co., St. Louis. (Butt Weld—Wrought Steel)
Midland Refractories Corporation, Chicago. (Roof Jacks)
Osborn Co., J. M. & L. A., Cleveland.
• Payne Furnace Co., Beverly Hills, Calif. (Insulated Aluminum and Galv. Iron)
Tri-State Heating Supply Co., Fort Wayne, Ind.
Wilder Manufacturing Co., Niles, O.
• Williams-Wallace Co., San Francisco.

PIPE AND FITTINGS, SHEET METAL

See Ducts and Fittings, Prefabricated

PITTSBURGH LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

PLATES, ALLOY

Allegheny Ludlum Steel Corp., Brackenridge, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh.
• American Brass Co., Waterbury, Conn. (Copper)
• American Rolling Mill Co., Middletown, O.
• Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn. (Copper and its alloys)
Dow Chemical Company, Midland, Mich. (Magnesium)
Great Lakes Steel Corporation, Ecorse, Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stainless Clad)
International Nickel Co., Inc., New York City. (Monel, Nickel, Inconel)
Jessop Steel Co., Washington, Pa. (Air Craft)
Lukens Steel Co., Coatesville, Pa.
• Republic Steel Corp., Cleveland.
• Revere Copper & Brass, Inc., New York City.
Technical Processes Div., Colonial Alloys Co., Philadelphia. (Stainless)
Universal-Cyclops Steel Corporation, Bridgeville, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, STEEL

• American Rolling Mill Co., Middletown, O.
• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
• Columbia Steel Co., San Francisco.
Granite City Steel Co., Granite City, Ill.
Great Lakes Steel Corp., Ecorse, Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stainless Clad)
Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jessop Steel Co., Washington, Pa.
Jones & Laughlin Steel Corp., Pittsburgh.
Lukens Steel Co., Coatesville, Pa.
• Republic Steel Corp., Cleveland.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wood Steel Co., Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, WROUGHT IRON

Byers Co., A. M., Pittsburgh.

POLISHERS

See Buffers, Grinders, Polishers, Sanders and Finishers, Metal

PREFABRICATED DUCTS

See Ducts and Fittings, Prefabricated

PRESSES AND DIES

Bath Co., Cyril, Cleveland.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Toledo, O.
Callahan Can Machine Co., Inc., Brooklyn.
Cincinnati Shaper Co., Cincinnati.
Clearing Machine Corp., Chicago. (Presses)
Cleveland Punch & Shear Works Co., Cleveland.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
• Dreis & Krump Mfg. Co., Chicago.
Equipment Sales Co., Oakland, Calif.
• Famco Machine Co., Racine, Wis. (Hand and foot)
• Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Henry & Wright Mfg. Co., Hartford, Conn.
Leslie Welding Co., Chicago. (Hand Punch Press)
Minster Machine Co., Minster, O.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Perkins Machine Co., Warren, Mass.
Service Machine Co., Elizabeth, N. J.
Swain Mfg. Co., Fred J., St. Louis.
• Verson Allsteel Press Co., Chicago.
Ward Machinery Co., Chicago.
Zeh & Hahnemann Co., Newark, N. J.

PROTECTORS, DOWNSPOUT

See Fittings and Accessories, Conductor

PSYCHROMETERS, SLING AND HAND-ASPIRATED

American Moistening Co., Providence, R. I.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
General Scientific Equipment Co., Philadelphia.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
Johnson Service Co., Milwaukee.
Leeds & Northrup Co., Philadelphia.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Norwood, Cincinnati.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia.
Scientific Instrument Co., Detroit.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
Weksler Thermometer Corp., New York City.

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PULLEYS, FAN AND MOTOR

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit.
Dayton Rubber Mfg. Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Duro Metal Products Co., Chicago.
Gates Rubber Co., Denver, Colo.
Goldens' Fdry. & Mach. Co., Columbus, Ga. (Cast Iron)
Horton Mfg. Co., Minneapolis.
Jones Fdry. & Mach. Co., W. A., Chicago.
• Lau Blower Co., Dayton, O.
Linderme Machine & Tool Co., Inc., Detroit.
• Maurey Mfg. Corp., Chicago.
Medart Co., St. Louis.
• Morrison Products, Inc., Cleveland.
Pyott Fdry. & Mach. Co., Chicago.
Reynolds Mfg. Co., Grand Rapids, Mich.
Rockwood Mfg. Co., Indianapolis.
Spun Steel Corp., Canton, O.
Swift Mfg. Co., Detroit, Mich.
Utility Far. Corporation, Los Angeles. (Appliance)
Wood's Sons Co., T. B., Chambersburg, Pa.

PULLEYS, FURNACE CHAIN

• Hart & Cooley Mfg. Co., Holland, Mich.
Medart Co., St. Louis.
• Mueller Furnace Co., L. J., Milwaukee.
• United States Register Co., Battle Creek, Mich.

PULLEYS, VARIABLE, PITCH

American Pulley Co., Philadephia.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool and Die Co., Detroit.
• Lau Blower Co., Dayton, Ohio.
Lewellen Mfg. Co., Columbus, Ind.
Mayne Products Co., Dayton, Ohio.
Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, DEEP-WELL

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chandler Co., Cedar Rapids, Ia.
Cook, Inc., A. D., Lawrenceburg, Ind.
Crane Co., Chicago.
Dayton Pump & Mfg. Co., Dayton, O.
Decatur Pump Co., Decatur, Ill.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago.
Goulds Pumps, Inc., Seneca Falls, N. Y.
• Heil Co., Milwaukee, Wis.
• J. K. Supply Co., Sandwich, Ill.
Jackson Co., Byron, Los Angeles. (Submersible)
Layne & Bowler, Inc., Memphis, Tenn.
Monarch Engineering Company, Dayton, O.
Myers & Bro. Co., F. E., Ashland, O.
Pacific Pumps, Inc., Huntington Park, Calif.
Peerless Pump Division, Food Machinery Corporation, Los Angeles. (Turbine)
Peerless Pump Div., Food Machinery Corp., Canton, O.
Pomona Pumps, Fairbanks, Morse & Co., Pomona, Calif.
Red Jacket Mfg. Co., Davenport, Ia.
Uniflow Mfg. Co., Erie, Pa.
Wayne Oil Burner Co., Fort Wayne, Ind.
Weil Pump Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, FUEL OIL (for Oil Burners)

• Automatic Products Company, Milwaukee.
DeLaval Steam Turbine Co., Trenton, N. J.
Kraissl Co., Inc., Hackensack, N. J.
May Oil Burner Div., Gerotor May Corp., Baltimore.
Monarch Manufacturing Works, Inc., Philadelphia.
Quimby Pump Co., Inc., Newark, N. J.
Roper Corp., Geo. D., Rockford, Ill.
Sundstrand Pump Div., Rockford, Ill.
Tuthill Pump Co., Chicago.
Viking Pump Company, Cedar Falls, Ia.
Wayne Oil Burner Co., Fort Wayne, Ind.
Webster Electric Co., Racine, Wis.

PUMPS, SHALLOW-WELL

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chandler Co., Cedar Rapids, Ia.
Chicago Pump Co., Chicago.
Cook, Inc., A. D., Lawrenceburg, Ind.
Crane Co., Chicago, Ill.
Dayton Pump & Mfg. Co., Dayton, O.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
• Heil Co., Milwaukee, Wis.
Layne & Bowler, Inc., Memphis, Tenn.
Monarch Engineering Company, Dayton, O.
Morris Machine Works, Baldwinsville, N. Y.
Myers & Bro. Co., F. E., Ashland, O.
Pacific Pumps, Inc., Huntington Park, Calif.
Peerless Pump Division, Food Machinery Corporation, Los Angeles. (Jet)
Peerless Pump Div., Food Machinery Corp., Canton, O.
Pomona Pumps, Fairbanks, Morse & Co., Pomona, Calif.
Red Jacket Mfg. Co., Davenport, Ia.
Riddell,Inc., W. A., Frederick, Md.
Robbins & Myers, Inc., Springfield, O.
Uniflow Mfg. Co., Erie, Pa.
Viking Pump Co., Cedar Falls, Ia.
Weil Pump Co., Chicago.
Weinman Pump Mfg. Co., Columbus, O.
Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, WATER CIRCULATING

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Metal Products Co., Fort Worth, Tex. (Miniature)
Beckett & Co., Thomas, Dallas, Tex. (for Evap. Coolers)
Bell & Gossett Company, Morton Grove, Ill.
Buffalo Pumps, Inc., Buffalo.
Chicago Pump Co., Chicago.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
De Laval Steam Turbine Co., Trenton, N. J.
Economy Pumps, Inc., Hamilton, O.
Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand, New York City.
Kehm Corporation, Chicago.
Lecourtenay Co., Newark, N. J.
Lewis & Co., Inc., Chas. S., St. Louis.
Monarch Engineering Company, Dayton, O.
Morris Machine Works, Baldwinsville, N. Y.
Myers & Bro. Co., F. E., Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Pacific Pumps, Inc., Huntington Park, Calif.
Palmer Electric Co., Detroit.
Peerless Pump Division, Food Machinery Corporation, Los Angeles. (Centrifugal)
Peerless Pump Div., Food Machinery Corp., Canton, O.
Pernot & Rich, Inc., Los Angeles.
Pomona Pumps, Fairbanks, Morse & Co., Pomona, Calif.
Quimby Pump Co., Inc., Newark, N. J.
Red Jacket Mfg. Co., Davenport, Ia.
Riddell, Inc., W. A., Frederick, Md.
Robbins & Myers, Inc., Springfield, O.
Roper Corp., Geo. D., Rockford, Ill.
Spiegel Corporation, G. B., Chicago.
Swaby Mfg. Co., Chicago.
Thrush & Co., H. A., Peru, Ind.
Trane Co., LaCrosse, Wis.
Trimount Rotary Power Co., East Dedham, Mass.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Utility Appliance Corporation, Los Angeles.
Viking Pump Co., Cedar Falls, Ia.
Wayne Oil Burner Co., Fort Wayne, Ind.
Weil Pump Co., Chicago.
Weinman Pump Mfg. Co., Columbus, O.
Worthington Pump & Machinery Corp., Harrison, N. J.
Yeomans Bros. Co., Chicago.

PUNCHES AND SHEARS COMBINED, LEVER OPERATED

Armstrong-Blum Mfg. Co., Chicago.
Bertsch & Co., Cambridge City, Ind.
Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
National Machine Tool Co., Racine, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Royersford Foundry & Machine Co., Royersford, Pa.
Weiss & Co., H., New York City.

PUNCHES, BENCH

Armstrong-Blum Mfg. Co., Chicago.
Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Clough, A. W., Meriden, Conn.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.

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Kidder Mfg. Co., J. F., Burlington, Vt.
Maplewood Machinery Co., Chicago.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia (Turret).

PUNCHES, COMBINATION HAND AND BENCH

Armstrong-Blum Mfg. Co., Chicago.
Bollaert, M., Oakland, Calif.
Champion Blower & Forge Co., Lancaster, Pa.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Parker-Kalon Corp., New York City.
• Peck, Stow & Wilcox Co., Southington, Conn.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, HAND

Allen, H. D., Los Angeles.
Armstrong-Blum Mfg. Co., Chicago.
Bertsch & Co., Cambridge City, Ind.
Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Works Co., Cleveland.
Clough, A. W., Meriden, Conn.
• Crescent Tool Co., Jamestown, N. Y.
• Damascus Steel Products Corporation, Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Ingels Elbow Machine Corporation, Chicago.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Maplewood Machinery Co., Chicago.
• Niagara Machine & Tool Works, Buffalo.
• Parker-Kalon Corp., New York City.
• Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia.
Service Machine Co., Elizabeth, N. J.
Stanley Tools, New Britain, Conn.
Weiss & Co., H., New York City.
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia (Turret).

PUNCHES, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Toledo, O.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Henry & Wright Mfg. Co., Hartford, Conn.
Kling Bros. Engineering Works, Chicago.
Maxant Button & Supply Co., Chicago.
New Albany Machine Mfg. Co., New Albany, Ind.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Perkins Machine Co., Warren, Mass.
Royersford Foundry & Machine Co., Royersford, Pa.
Service Machine Co., Elizabeth, N. J.
Swaine Mfg. Co., Fred J., St. Louis.
Thomas Machine Manufacturing Co., Pittsburgh.
• Verson Allsteel Press Co., Chicago.
Wales-Strippit Corporation, North Tonawanda, N. Y.
Weiss & Co., H., New York City.
• Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia (Turret).
Zeh & Hahnemann Co., Newark, N. J.

QUADRANTS, DAMPER

See Regulators, Damper Sets

RECORDERS, HUMIDITY, PORTABLE

Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Marsh Corporation, Jas. P., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Scientific Instrument Co., Detroit.
Tagliabue Div. C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.

RECORDERS, TEMPERATURE, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh.
Bailey Meter Company, Cleveland.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Defender Instrument & Regulator Co., St. Louis.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Marsh Corporation, Jas. P., Chicago.
Mason-Neilan Regulator Co., Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Thermometers, Inc., Norwood, Cincinnati (mercury actuated)
Preferred Utilities Mfg. Corp., New York City.
Scientific Instrument Co., Detroit.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
Weksler Thermometer Corp., New York City.

REFRACTORIES

Babcock & Wilcox Co., New York City.
Bird Archer Co., Philadelphia.
Botfield Refractories Company, Philadelphia.
Briggs Clarifier Co., Ceramics Sales Div., Bethesda, Md.
Chicago Fire Brick Co., Chicago.
Commonwealth Products Co., Philadelphia.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fireline Stove & Furnace Lining Co., Chicago. (For Hearths and Firepot Linings)
General Insulating Products Co., Brooklyn.
Gilbert & Son, Harry E., Bridgeport, Conn. (Radiant).
Green Fire Brick Co., A. P., Mexico, Mo.
Johns-Manville, New York City (Cement and monolithic).
Krehbiel Co., J. H., Chicago.
Laclede-Christy Clay Products Co., St. Louis (Fire Clay).
Ludowici-Celadon Co., Chicago.
McLeod & Henry Co., Inc., Troy, N. Y. (Silican Carbide).
Munn and Steele, Inc., Newark, N. J.
Plibrico Jointless Firebrick Co., Chicago (castable and plastic fire brick).
Preferred Utilities Mfg. Corp., New York City.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City (Firebrick and Cements)
Ramtite Co., Chicago (Castable).
Refractory & Insulation Corp., New York City.
Rex Clay Products Co., Detroit.
Robinson Insulation Co., Great Falls, Mont.
Rutland Fire Clay Co., Rutland, Vt. (Retort Cement)
Standard Fuel Engineering Co., Detroit.
Taylor Sons Co., Charles, Cincinnati, O.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Universal Zonolite Insulation Co., Chicago (Brick and Cement).
Walsh Refractories Corp., St. Louis.

REGALVANIZING EQUIPMENT AND MATERIALS

Galv-Weld Products, Dayton, O.

REGISTER SEALS

See Seals for Registers

REGISTER SHIELDS

See Shields, Warm Air Register

REFRIGERATING UNITS

See Compressors, Refrigerating

REGISTERS, DIRECTIONAL FLOW

A-J Manufacturing Co., Kansas City, Mo.
• Air Control Products, Inc., Coopersville, Mich.
Airo-Fin Grille Co., Detroit.
• Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee, Wis.
• Char-Gale Mfg. Co., Minneapolis.
Controlair Manufacturing Co., Los Angeles.
Diamond Manufacturing Co., Wyoming, Pa.
Elsey Metal Specialties Co., Detroit.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
• Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
• Independent Register Co., Cleveland.
Middleton Mfg. & Sales Co., Minneapolis.
Register & Grille Mfg. Co., Brooklyn.
• Rock Island Register Co., Rock Island, Ill.
Standard Stamping & Perforating Co., Chicago.
Stewart Manufacturing Co., Bloomfield, N. J.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Air Conditioning Corp., Minneapolis, Minn.
• United States Register Co., Battle Creek, Mich.
Utility Appliance Corp., Los Angeles.
• Waterloo Register Co., Waterloo, Ia.

REGISTERS, HEATING AND VENTILATING

A-J Manufacturing Co., Kansas City, Mo. (Double Diffuser).
• Air Control Products, Inc., Coopersville, Mich.
Airo-Fin Grille Co., Detroit.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corporation of America, New York City.
• Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee.
Brown Steel Tank Co., Minneapolis.
Controlair Manufacturing Co., Los Angeles.
Diamond Mfg. Co., Wyoming, Pa.

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- Char-Gale Mfg. Co., Minneapolis.
- Effecto Grille Co. Detroit.
  Empire Ventilation Equipment Co., Long Island City, N. Y.
- Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
- Hart & Cooley Mfg. Co., Holland, Mich.
  Hendrick Mfg. Co., Carbondale, Pa.
- Independent Register Co., Cleveland.
  Middleton Mfg. & Sales Co., Minneapolis.
- Mueller Furnace Co., L. J., Milwaukee.
  Register & Grille Mfg. Co., Inc., Brooklyn.
- Rock Island Register Co., Rock Island, Ill.
  Standard Stamping & Perforating Co., Chicago.
  Stewart Manufacturing Co., Bloomfield, N. J.
- Tuttle & Bayley, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
  Waterloo Register Co., Waterloo, Ia.

REGULATORS, DAMPER SETS

- Adams Company, The, Dubuque, Ia.
- Air Control Products, Inc., Coopersville, Mich.
- Automatic Products Co., Milwaukee.
  Barber-Colman Company, Rockford, Ill.
- Cole-Sullivan Engineering Co., Minneapolis.
  Controlair Manufacturing Co., Los Angeles.
  Fossum Mfg. Co., M. H. St. Paul, Minn.
- Gerett Co., M. A., Milwaukee.
  Goese Mfg. Co., Milwaukee.
- Hart & Cooley Mfg. Co., Holland, Mich.
  Joal Mfg. Corp., Toledo, O.
  Kerentoff, G. L., Cincinnati.
  Kieley & Mueller, Inc., North Bergen, N. J.
  Martens & Stormoen, Boston.
- Mercoid Corporation, Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.
  Northern Weatherstrip Co., Duluth, Minn.
  Ohio Products Co., Cleveland.
- Parker-Kalon Corp., New York City.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corporation, Milwaukee.
- Sampsel Time Control, Inc., Spring Valley, Ill.
  Sarcotherm Controls, Inc., Chicago.
  Thrush & Co., H. A., Peru, Ind.
  Trane Company, LaCrosse, Wis.
- United States Register Co., Battle Creek, Mich.
  Western Air Devices, Los Angeles.
  Young Regulator Co., Cleveland.

REGULATORS, FURNACE DRAFT, MECHANICAL

Au-Temp-Co Corp., New York City.
Barber-Colman Co., Rockford, Ill.
Campbell Engineering Co., Appleton, Wis. (Electric)
Defender Instrument & Regulator Co., St. Louis.
Fulton Syphon Co., Knoxville, Tenn.
- Hart & Cooley Mfg. Co., Holland, Mich.

Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland.
Little Janitor Furnace Clock Co., New York City.
- Minneapolis-Honeywell Regulator Co., Minneapolis.

Timm & Son, P. C., Lincoln, Nebr.

RELAYS, ELECTRICAL

Advance Electric and Relay Co., Los Angeles.
Allen-Bradley Co., Milwaukee.
American Instrument Co., Silver Spring, Md.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York City.
Automatic Switch Co., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Bardco Mfg. & Sales Co., Los Angeles.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland.
Consolidated Car-Heating Co., Inc., Albany, N. Y.
Cook Electric Co., Chicago.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn. (Time)
Cutler-Hammer, Inc., Milwaukee.
Davis & Co., Inc., Dean W., Chicago.
- Detroit Lubricator Co., Detroit.

Durakool, Inc., Elkhart, Ind. (Mercury).
Eastern Air Devices, Inc., Brooklyn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Ess Instrument Co., Fort Lee, N. J.
- General Controls Co., Glendale, Calif.

General Electric Co., Schenectady, N. Y.
- Gleason-Avery, Inc., Auburn, N. Y.

Guardian Electric Mfg. Co., Chicago.
H-B Instrument Co., Inc., Philadelphia.
Hart Mfg. Co., Hartford, Conn.
Industrial Engineering Corp., Terre Haute, Ind.
McCorkle Co., D. H., Berkeley, Calif.
- Mercoid Corp., Chicago.
- Minneapolis-Honeywell Regulator Co., Minneapolis.

Monitor Controller Co., Baltimore.
National Time & Signal Corp., Detroit.
- Penn Electric Switch Co., Goshen, Ind.
- Perfex Corp., Milwaukee.

Philadelphia Thermometer Co., Philadelphia.
Precision Thermometer & Instrument Co., Philadelphia.
Rhodes, Inc., M. H., Hartford, Conn.
Reynolds Electric Co., Chicago.
- Sampsell Time Control, Inc., Spring Valley, Ill.

Small Motors, Inc., Chicago.
Spencer Thermostat Co., Attleboro, Mass.
Square D Co., Detroit.
Struthers-Dunn, Inc., Philadelphia.
Synchro-Start Products, Chicago.
Thrush & Co., H. A., Peru, Ind.
Tork Clock Company, Inc., Mount Vernon, N. Y.
Triplex Mfg. Co., Peru, Ind.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Weston Electrical Instrument Corp., Newark, N. J.
Zenith Electric Co., Chicago.

REPAIRS, STOVE AND FURNACE

- Adams Company, The, Dubuque, Ia.

Associated Heater Parts Co., Chicago. (Furnace)
Banner Repair Parts Co., Youngstown, O.
- Brauer Supply Co., A. G., St. Louis.

Central Furnace & Stove Repair Co., St. Louis.
Cincinnati Stamping Co., Cincinnati.
Clark Co., Henry N., Boston.
- Des Moines Stove Repair Co., Des Moines, Ia.

Eselgroth & Co., Newark, N. J.
Faultless Heater Corp., Cleveland.
Foote Foundry Co., J. B., Fredericktown, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Klaine Co., F. A., Cincinnati, O.
Kramer Bros. Foundry Co., Dayton, O.
Livingston Repair, Marshall, Mich.
Metzner Stove Repair Co., Kansas City, Mo.
Miller & Son, C. Arthur, Elmira, N. Y. (Furnace).
National Foundry & Furnace Co., Dayton, O.
- Northwestern Stove Repair Co., Chicago.
- Omaha Stove Repair Works, Omaha, Neb.
- Peerless Foundry Co., Indianapolis, Ind.

Peninsular Stove Co., Detroit.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Shamblen Furnace Parts Co., Pittsburgh.
Smith Furnace Co., New Castle, Pa.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
Stove Manufacturing Corporation, Newark, N. J.
Tri-State Heating Supply Co., Fort Wayne, Ind.

RETINNING EQUIPMENT and MATERIALS

Galv-Weld Products, Dayton, O.
Retinnning Manufacturing Co., Chicago.

RIDGE ROLLS AND RIDGING (METAL)

- American Rolling Mill Co., Middletown, O. (Galvanized).

American Steel & Wire Co., Cleveland.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Berger Bros. Co., Philadelphia.

Berger Mfg. Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa. (Metal).

Biersach & Niedermeyer Co., Milwaukee
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
- Hussey & Co., C. G., Pittsburgh (Copper).

Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
- Milcor Steel Co., Milwaukee.

New Delphos Manufacturing Co., Delphos, O.
Newport Rolling Mill Co., Newport, Ky.
Osborn Co., J. M. & L. A., Cleveland.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Kankakee, Ill.
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux City, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Southern States Iron Roofing Co., Savannah, Ga.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Van Noorden Co., E., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
- Williams-Wallace Co., San Francisco.

Woolwine Metal Products Co., Los Angeles.

RIDGE VENTILATORS

See Ventilators, Roof, Ridge

RIVETS, ALLOY

- Bethlehem Steel Co., Bethlehem, Pa.

Clark Bros. Bolt Co., Milldale, Conn.
Cooper Co., Clark, Palmyra, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass. (Silver)
Hassall, Inc., John, Brooklyn.
National Screw & Mfg. Co., Cleveland.

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• Republic Steel Corp., Cleveland.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.
Victory Mfg. Co., South Pasadena, Calif. (Plastic)

RIVETS, ALUMINUM

Aluminum Company of America, Pittsburgh.
Bridgeport Screw Co., Bridgeport, Conn.
• Cherry Rivet Co., Los Angeles (Blind).
Chicago Rivet & Machine Co., Bellwood, Ill.
Cooper Co., Clark, Palmyra, N. J.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Explosive).
Goodrich Co., B. F., Akron, O. (Blind)
Hassall, Inc., John, Brooklyn.
Shellmar Products Co., South Pasadena, Calif.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, BRASS, COPPER AND IRON

Blake & Johnson Co., Waterville, Conn.
Bridgeport Screw Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
• Cherry Rivet Co., Los Angeles. (blind)
Chicago Rivet & Machine Co., Bellwood, Ill.
Clendenin Brothers, Inc., Baltimore (Brass, Copper).
Conklin Brass & Copper Co., Inc., T. E., New York City.
Cooper Co., Clark, Palmyra, N. J.
Downs-Smith Brass & Copper Co., New York City.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del. (Explosive)
Goodrich Co., B. F., Akron, O. (Blind-Brass)
Hassall, Inc., John, Brooklyn.
• Hussey & Co., C. G., Pittsburgh .
National Screw & Mfg. Co., Cleveland.
Taunton & Company, Inc., John H., New York City.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, STEEL

Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless)
Atlantic Steel Company, Atlanta, Ga.
Atlas Bolt & Screw Co., Cleveland.
• Bethlehem Steel Co., Bethlehem, Pa.
Carlin Co., Anthony, Cleveland.
• Cherry Rivet Co., Los Angeles. (Blind)
Chicago Rivet & Machine Co., Bellwood, Ill.
Clark Bros. Bolt Co., Millidale, Conn.
Cooper Co., Clark, Palmyra, N. J.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del. (and other materials—Explosive)
National Screw & Mfg. Co., Cleveland.
• Republic Steel Corporation, Cleveland.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

ROD, GAS WELDING

Air Reduction Sales Co., New York City.
• American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Atlantic Steel Company, Atlanta, Ga.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Steel & Wire Co., Chicago.
Crucible Steel Co. of America, New York City (Stainless).
Dow Chemical Company, Midland, Mich. (Magnesium)
Downs-Smith Brass & Copper Co., Inc., New York City.
Duraloy Co., Scottsdale, Pa. (Stainless).
Eutectic Welding Alloys Company, New York City.
International Nickel Co., Inc., New York City (Monel).
Linde Air Products Co., The, New York City.
Marquette Mfg. Co., Inc., Minneapolis.
Maurath, Inc., Cleveland.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div., Monessen, Pa. (Stainless Steel).
• Revere Copper & Brass, Inc., New York City.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Corp., San Francisco.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Wickwire Spencer Steel Co., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS

See Bearings, Roller

ROOFING, ALUMINUM

Air-O-Cel Industries, Inc., Detroit.
Fingles Co., The, Baltimore.
Southern States Iron Roofing Co., Savannah, Ga.

ROOFING, BUILT-UP

Air-O-Cel Industries, Inc., Detroit.
American Asphalt Roof Corp., Kansas City, Mo.
Barber Co., Inc., Philadelphia.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Bayonne Steel Products Co., Newark, N. J.
Bird & Son, Inc., East Walpole, Mass.
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, O.
Certain-teed Products Corp., New York City.
Detroit Steel Products Co., Detroit.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Globe Roofing Products Co., Inc., Whiting, Ind.
Johns-Manville, New York City.
Koppers Co., Inc., Pittsburgh. (Pitch and Felt)
Lehon Company, Chicago.
Logan-Long Co., Chicago.
National Mfg. Corp., Tonawanda, N. Y.
Nelson Mfg. Co., B. F., Minneapolis.
Ohio Paper Co., Miamisburg, Ohio.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh.
Ruberoid Co., New York City.
Southport Paint Co., Savannah, Ga.
United States Gypsum Co., Chicago.

ROOFING, COPPER

• American Brass Co., Waterbury, Conn.
Braden Mfg. Co., Terre Haute, Ind.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Copper Roofs Corp., Milwaukee.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
• Hussey & Co., C. G., Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
New Haven Copper Co., Seymour, Conn.
Perkinson & Brown, Chicago.
• Revere Copper & Brass, Inc., New York City.

ROOFING, IRON

• American Rolling Mill Co., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Byers Co., A. M., Pittsburgh (Wrought Iron).
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Edwards Manufacturing Co., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
International Steel Company, Evansville, Ind.
Protected Steel Products, Washington, Pa.
• Republic Steel Corp., Cleveland.
Southern States Iron Roofing Co., Savannah, Ga.
Sioux Steel Co., Sioux City, Ia.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Art Metal Co., Tiffin, Ohio.

ROOFING, LEAD

Alpha Metals, Inc., Brooklyn.
American Smelting and Refining Co., New York City.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Copper Roofs Corporation, Milwaukee.
Downs-Smith Brass & Copper Co., Inc., New York City.
Eagle-Picher Co., Cincinnati.
Fingles Co., The, Baltimore.
Flemm Lead Co., Inc., Long Island City, N. Y.
Illinois Zinc Co., Chicago.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Rochester Lead Works, Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn.

ROOFING, SLATE

Barrett Division, Allied Chemical & Die Corp., New York City (Slate Surfaced Shingles and Rolls).
Jackson-Bangor Slate Co., Pen Argyl, Pa.
North Bangor Slate Co., Bangor, Pa.
Norton Brothers, Granville, N. Y.
Perkinson & Brown, Chicago.
Rising & Nelson Slate Co., West Pawlet, Vt.
Sheldon Slate Products Co., Inc., Granville, N. Y. (Colors).
Structural Slate Co., Pen Argyl, Pa.
Vendor Slate Co., Inc., Nazareth, Pa.
Vermont Structural Slate Co., Inc., Fair Haven, Vt.

ROOFING, STEEL

• American Rolling Mill Co., Middletown, O.
American Steel Band Co., Pittsburgh.
American Steel & Wire Co., Cleveland.
Apollo Steel Company, Apollo, Pa.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
Berger Mfg. Div. Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
• Cheney Metal Products Co., Trenton, N. J. (Protective Coating—Corrugated)
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• Columbia Steel Co., Sub. U. S. Steel Corp., San Francisco.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Products Co., Detroit.
Edwards Manufacturing Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Inland Steel Company, Chicago.
International Steel Company, Evansville, Ind.
Klauer Manufacturing Co., Dubuque, Ia.

• Advertisement in this issue. See Index to Advertisers, pages 317-318.

LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Perkinson & Brown, Chicago.
Protected Steel Products, Washington, Pa.
Reeves Steel & Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Robertson Co., H. H., Pittsburgh.
Sioux Steel Co., Sioux Falls, S. D.
St. Paul Corrugating Co., St. Paul, Minn.
Southern States Iron Roofing Co., Savannah, Ga.
Superior Sheet Steel Co. Div. Continental Steel Corp., Canton, O.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Truscon Steel Co., Youngstown, O.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corporation, Wheeling, W. Va.

ROOFING, TERNE PLATE

• American Rolling Mill Co., Middletown, Ohio.
Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Edwards Manufacturing Co., Cincinnati.
Follansbee Steel Corporation, Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
• Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
• Republic Steel Corp., Cleveland.
Sioux Steel Co., Sioux Falls, S. D.
Wheeling Corrugating Company, Wheeling, W. Va.
Wheeling Metal & Mfg. Co., Moundsville, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ROOFING, TILE (CLAY & CONCRETE)

Devoe & Raynolds Co., Inc., New York.
Hood Co., B. Mifflin, Daisy, Tenn. (Clay).
Ludowici-Celadon Co., Chicago.
Murray Tile Co., Cloverport, Ky.
National Fireproofing Corp., Pittsburgh.
Perkinson & Brown, Chicago.
Truscon Laboratories, Detroit.
United States Gypsum Co., Chicago.

ROOFING, TIN

Berger Mfg. Div. of Republic Steel Corp., Canton, O.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
• Follansbee Steel Corporation, Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
• Milcor Steel Co., Milwaukee.
Perkinson & Brown, Chicago.
• Republic Steel Corp., Cleveland.
Sioux Steel Co., Sioux Falls, S. D.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

ROOFING, ZINC

American Zinc Products Co., Greencastle, Ind.
Barnes Metal Products Co., Chicago.
Downs-Smith Brass & Copper Co., Inc., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Hegeler Zinc Company, Danville, Ill.
Illinois Zinc Co., Chicago.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York City.
Wheeling Corrugating Co., Wheeling, W. Va. (Coated).
Wheeling Steel Corp., Wheeling, W. Va. (Coated).

ROOFTRIM, STEEL (MOULDINGS) FOR EAVES AND RAKES

Penn Supply & Metal Corp., Philadelphia.

RUST PROTECTION FOR METALS

See Chemicals, Rust Preventive

SAFETY GLASS

See Glass, Safety

SANDERS

See Buffers, Grinders, Polishers and Sanders

SAVERS, HEAT

Cary Mfg. Co., Waupaca, Wis.
Condensation Engineering Corp., Chicago.
Gerhardt, W. F., Richmond, Va. (oil or gas).
• Harvey-Whipple, Inc., Springfield, Mass.
Meyers Fuel Saver Co., Inc., Janesville, Wis.
Reynolds Electric Co., Chicago.

SAWS, BAND, SHEET METAL CUTTING

Atkins and Co., E. C., Indianapolis.
Barnes, W. O., Detroit.
Disston & Sons, Inc., Henry, Philadelphia.
Doall Company, Des Plaines, Ill.
DoAll Company, Minneapolis.
Grob Brothers, Grafton, Wis.
Disston & Sons, Inc., Henry, Tacony Sta., Philadelphia.
• Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
Tannewitz Works, Grand Rapids, Mich.
• Wells Mfg. Corp., Three Rivers, Mich.

SAWS, HACK, POWER

Air-Speed Tool Co., Los Angeles. (Pneumatic)
Atkinson and Co., E. C., Indianapolis.
Champion Blower & Forge Co., Lancaster, Pa.
• Chicago Precision Equipment Co., Chicago.
Disston & Sons, Inc., Henry, Tacony Sta., Philadelphia.
Johnson Manufacturing Corporation, Albion, Mich. (Wet for high speed).
Racine Tool & Machine Co., Racine, Wis.
Robertson, F. L., Buffalo.
Royersford Foundry & Machine Co., Royersford, Pa.
Syntron Co., Homer City, Pa. (Electric, semi-portable).
• Wells Manufacturing Corp., Three Rivers, Mich.

SCREENS, SUN REFLECTING

Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

SCREWS, DRIVE

American Screw Co., Providence, R. I.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless)
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corp., New Britain, Conn.
Elco Tool & Screw Corporation, Rockford, Ill.
Hassall, Inc., John, Brooklyn.
Hillwood Manufacturing Co., Cleveland.
Industrial Screw Company, Chicago.
National Lock Co., Rockford, Ill.
National Screw & Mfg. Co., Cleveland.
• Parker-Kalon Corp., New York City (Hardened Metallic).
Pheoll Manufacturing Co., Chicago.
Turner & Seymour Mfg. Co., Torrington, Conn.

SCREWS, FEED, STOKER

Bros Boiler & Mfg. Co., Wm., Minneapolis.
Burnside Steel Foundry Co., Chicago.
Chicago Steel Foundry Co., Chicago.
Crown Iron Works, Minneapolis, Minn.
Davy Fuel & Supply Co., Stoker Div., Detroit.
Farrell-Cheek Steel Co., Stoker Parts Div., Sandusky, O.
• Schwab Safe Co., Lafayette, Ind.
Wyoming Stoker Worm Co., Wyoming, Pa.

SCREWS, SHEET METAL

Aluminum Co. of America, Pittsburgh (Aluminum).
American Screw Co., Providence, R. I.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless Steel).
Atlas Bolt & Screw Co., Cleveland.
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.
Elco Tool & Screw Corporation, Rockford, Ill.
Industrial Screw Co., Chicago.
National Lock Co., Rockford, Ill.
National Screw & Mfg. Co., Cleveland.
• Parker-Kalon Corp., New York City.
Pheoll Manufacturing Co., Chicago.
Shakeproof, Inc., Chicago.
• United States Register Co., Battle Creek, Mich.

SEALS for REGISTERS

• Excel Heating & Air Conditioning Co., Chicago.

SEAMER MACHINES

See Machines, Seaming

SETTING DOWN MACHINES

See Machines, Setting Down

SHEARS, CIRCLE, HAND

Compton Shear Co., W. H., Newark, N. J.
• Crescent Tool Co., Jamestown, N. Y.
Klenk's Aviation Snips, Wilmington, Del.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Wiss & Sons Co., J., Newark, N. J.

SHEARS, CIRCLE, POWER

Kling Bros. Engineering Works, Chicago.
• Libert Machine Co., Green Bay, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
• Whiting Corp., Harvey, Ill.
Wysong & Miles Co., Greensboro, N. C.
Yoder Company, Cleveland.

SHEARS, HAND AND BENCH

See Snips and Shears, Bench and Hand

SHEARS AND PUNCHES COMBINED

See Punches and Shears Combined

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SHEARS, ELECTRIC, PORTABLE

• Black & Decker Mfg. Co., Towson, Md.
C-B Tool Co., Lancaster, Pa. (Cutting Head only).
O'Neil-Irwin Manufacturing Co., Minneapolis.
• Skilsaw, Inc., Chicago.
• Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Van Dorn Electric Tool Co., Towson, Md.
York Electric and Machine Company, York, Pa.

SHEARS, ROTARY, SLITTING, HAND

• Marshalltown Manufacturing Co., Marshalltown, Ia.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
Ward Machinery Co., Chicago.
• Whiting Corporation, Harvey, Ill. (and Power)

SHEARS, ROTARY, SLITTING, POWER

Kling Bros. Engineering Works, Chicago.

SHEARS, SQUARING, FOOT

Barth Mfg. Co., Millidale, Conn.
Bertsch & Co., Cambridge City, Ind.
• Famco Machine Co., Racine, Wis.
• Niagara Machine & Tool Works, Buffalo.
• Peck, Stow & Wilcox Co., Southington, Conn.
Royersford Foundry & Machine Co., Royersford, Pa.
Wysong & Miles Co., Greensboro, N. C.

SHEARS, SQUARING, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss & Co., E. W., Toledo, O.
Cincinnati Shaper Co., Cincinnati.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool and Machine Co., East St. Louis, Ill.
• Niagara Machine & Tool Works, Buffalo.
O'Neil-Irwin Manufacturing Co., Minneapolis.
• Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, O.
• Whitney Metal Tool Company, Rockford, Ill.
Wysong & Miles Co., Greensboro, N. C.

SHEET METAL PARTS

See Mouldings and Trim; also Stampings, Metal

SHEETS, ALUMINUM

Aluminum Company of America, Pittsburgh.
American Nickeloid Company, Peru, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Aluminum Company of America, Pittsburgh.
American Nickeloid Company, Peru, Ill. (Nickel, Chromium, Brass, Copper).
• American Rolling Mill Co., Middletown, O. (Aluminum)
General Plate, Div. Metals & Controls Corp., Attleboro, Mass. (Precious to Base Metal)
Granite City Steel Company, Granite City, Ill.
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa. (Stainless).
Lukens Steel Co., Coatesville, Pa. (Nickel, Monel, Inconel)

SHEETS, COPPER

• American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., Inc., New York City.
• Hussey & Co., C. G., Pittsburgh.
New Haven Copper Co., Seymour, Conn.
• Revere Copper & Brass, Inc., New York City.
U. S. Brass & Copper Co., Hyde Park, Mass.
Weirton Steel Co., Weirton, W. Va. (Electrolitic Zinc Coated)
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill. (Brass, Bronze, Phosphor Bronze).

SHEETS, COPPER, LEAD COATED

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Downs-Smith Brass & Copper Co., New York City.
• Hussey & Co., C. G., Pittsburgh.
Lamb & Ritchie Co., Cambridge, Mass.
Ledcote Products Co., Long Island City, N. Y.
New Haven Copper Co., Seymour, Conn.
• Revere Copper & Brass, Inc., New York City.
U. S. Brass & Copper Co., Hyde Park, Mass.

SHEETS, GALVANNEALED

Berger Mfg. Div., Republic Steel Corp., Canton, O.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Continental Steel Corp., Kokomo, Ind.
Newport Rolling Mill Co., Div., Andrews Steel Co., Newport, Ky.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
Superior Sheet Steel Co., Canton, O.

SHEETS, LEAD

Alpha Metals, Inc., Brooklyn.
• American Smelting and Refining Co., New York City.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Continental Steel Corp., Kokomo, Ind.
Downs-Smith Brass & Copper Co., Inc., New York City.
Eagle-Picher Co., Cincinnati.
Flemm Lead Co., Inc., Long Island City, N. Y.
Glaser Lead Co., Inc., Brooklyn.
Illinois Zinc Co., Chicago.
Lissberger & Son., Inc., Marks, Long Island City, N. Y.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Rochester Lead Works, Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn.
• Weirton Steel Co., Weirton, W. Va. (Alloy Coated)

SHEETS, MAGNESIUM

Dow Chemical Company, Midland, Mich.

SHEETS, MONEL

International Nickel Company, Inc., New York City.

SHEETS, NICKEL

International Nickel Co., Inc., New York City.

SHEETS, SPECIAL METAL

(Nickel Zinc, Chrome Zinc, Nickel Coated Copper, Chromium Coated Copper, Nickel Coated Steel, Chromium Coated Steel, Chromium Coated Nickel Silver, Zinc Brass, Zinc Copper, etc.)
Allegheny Ludlum Steel Corp., Brackenridge, Pa. (Electrical)
Alpha Metals, Inc., Brooklyn, N. Y. (alloy)
• American Brass Co., Waterbury, Conn. (Copper-Silicon Alloys)
American Nickeloid Co., Peru, Ill.
Apollo Metal Works, Chicago. (Plated—Nickel Zinc, Nickel Copper, Chrom Copper, Chrom Steel, Nickel Steel, Zinc Steel, Chrome Brass)
Apollo Steel Co., Apollo, Pa.
• Bethlehem Steel Co., Bethlehem, Pa. (Nickel—Chromium)
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Muntz Metal, Nickel Silver, Phosphor Bronze).
Duriron Company, Inc., Dayton, O. (acid resisting)
• Hussey & Co., C. G., Pittsburgh.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
International Nickel Co., Inc., New York City. (Inconel)
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Milwaukee.
National Sheet Metal Co., Peru, Ill.
Reeves Steel & Manufacturing Co., Dover, O.
• Republic Steel Corp., Cleveland.
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill. (Non-Ferrous).

SHEETS, STAINLESS

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
• American Rolling Mill Co., Middletown, O.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Crucible Steel Co. of America, New York City (Two-Ply).
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
Superior Steel Corp., Pittsburgh.
Technical Processes Div., Colonial Alloys Co., Philadelphia.
Universal-Cyclops Steel Corp., Bridgeville, Pa.

SHEETS, STEEL

(Polished and Blue, Corrugated and Plain, Black, Terne and Galvanized)
• American Rolling Mill Co., Middletown, O.
American Steel & Wire Co., Cleveland (Galvanized).
Apollo Steel Co., Apollo, Pa.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
• Columbia Steel Co., San Francisco.
Crucible Steel Company of America, New York City.
Empire Sheet & Tin Plate Co., Mansfield, O.
• Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Great Lakes Steel Corporation, Detroit.
Inland Steel Co., Chicago.
Jessop Steel Co., Washington, Pa. (Carbon, High-Speed, Alloy)
Jones & Laughlin Steel Corp., Pittsburgh.
Lyon, Conklin & Co., Inc., Baltimore.
Newport Rolling Mill Co., Newport, Ky.
Niles Rolling Mill Co., Niles, O.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.

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Reeves Steel & Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O. (Galvanized, Hot Rolled and Long Ternes).
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wood Steel Company, Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, COPPER BEARING

• American Rolling Mill Co., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
•Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
• Columbia Steel Co., San Francisco.
• Continental Steel Corp., Kokomo, Ind.
• Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago. (Copper Alloy, Zinc Alloy)
Jones & Laughlin Steel Corp., Pittsburgh.
Newport Rolling Mill Co., Newport, Ky.
Reeves Mfg. Co., Dover, O.
• Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, TIN PLATE

Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.
• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegie-Illinois Steel Corp., Pittsburgh.
Downs-Smith Brass & Copper Co., Inc., New York City.
• Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh (Tinned).
Lyon, Conklin & Co., Inc., Baltimore.
• Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
• Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, ZINC

American Nickeloid Co., Peru, Ill.
American Zinc Products Co., Greencastle, Ind.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Downs-Smith Brass & Copper Co., Inc., New York City.
Hegeler Zinc Co., Danville, Ill.
Illinois Zinc Co., Chicago.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York City.

SHIELDS, WARM AIR REGISTER

Gammeter Co., W. F., Cadiz, O. (With Humidifier).
Kauffman Air Conditioning Corp., St. Louis.
Marshallan Mfg. Co., Cleveland.
Patent Novelty Company, Fulton, Ill. (With humidifier).
Pentecost & Craft Co., Terra Haute, Ind.
Schoedinger, F. O., Columbus, O.

SHINGLES AND TILE, METAL

Ames Company, W. R., San Francisco.
Berger Manufacturing Div., Republic Steel Corp., Canton, O.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Edwards Manufacturing Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
Globe Iron Roofing & Corrugating Co., Newport, Ky. (galvanized and painted terne).
Herbert & Sons, T. L., Nashville, Tenn.
Illinois Zinc Co., Chicago (Zinc)
Miller & Doing, Brooklyn.
New Haven Copper Co., Seymour, Conn. (Copper).
Sheet Metal Mfg. Co., Inc., Brooklyn.
Southern States Iron Roofing Co., Savannah, Ga.
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galv. Steel).
Wheeling Corrugating Co., Wheeling, W. Va. (steel shingles).
• Williams-Wallace Co., San Francisco. (Painted tin and galv.)

SHUTTERS

See Louvres and Shutters

SHUTTERS & DOORS, FIRE

See Doors and Shutters, Fire

SKYLIGHT LIFTS

See Lifts, Skylight

SKYLIGHTS

Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
American Sheet Metal Works, New Orleans, La.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
Biersach & Niedermeyer Co., Milwaukee.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Danzer Metal Works Co., Hagerstown, Md.
Edwards Mfg. Co., Inc., Cincinnati.
Fingles Co., The, Baltimore.
Flynn Mfg. Co., Michael, Philadelphia.
Gehri Company, Tacoma, Wash.
General Sheet Metal Works, Inc., Bridgeport, Conn. (Puttyless).
Herbert & Sons, T. L., Nashville, Tenn.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
International Steel Co., Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lee & Son Co., Thomas, Cincinnati.
Main Cornice Works, Los Angeles.
Midwest Aluminum Products, Inc., Milwaukee.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Northern Furnace & Supply Co., Billings, Mont.
Overly Manufacturing Co., Greensburgh, Pa.
Perkinson & Brown, Chicago.
Riester & Thesmacher Co., Cleveland.
Riggin Metal Products, Kankakee, Ill.
Robertson Co., H. H., Pittsburgh (Structural).
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Tiffin Art Metal Co., Tiffin, Ohio.
Van Noorden Co., E., Boston.
Vent-O-Lite Co., Chicago. (Industrial, Ventilating, Puttless).
Ward Co., H. H., Chester, Pa.
• Willis Steel Corporation, Galesburg, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.
York Corrugating Co., York, Pa.

SLEEVE BEARINGS

See Bearings, Sleeve

SLITTING MACHINES

See Machines, Slitting

SMOKE PIPE

See Pipe, Smoke

SNIPS AND SHEARS, BENCH AND HAND

Armstrong-Blum Mfg. Co., Chicago.
Bartlett Mfg. Co., Detroit.
Bergman Tool Mfg. Co., Buffalo (Bench).
Berridge Shear Co., Sturgis, Mich. (hand)
• Beverly Shear Co., Chicago.
• Bremil Mfg. Co., Erie, Pa. (Shears).
Clauss Shear Co., Freemont, O. (hand)
Compton Shear Co., W. H., Newark, N. J.
• Crescent Tool Co., Jamestown, N. Y.
Grobet File Corp. of America, New York City.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Klenk's Aviation Snips, Wilmington, Del.
O'Neil-Irwin Manufacturing Co., Minneapolis.
Packham Crimmer Company, Mechanicsburg, O. (Nibler Snips)
• Peck, Stow & Wilcox Co., Southington, Conn.
• Penn Tool Company, Philadelphia.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Snap-On Tools Corporation, Kenosha, Wis.
Viking Shear Co., Erie, Pa. (Shears).
• Wiss & Sons Co., J., Newark, N. J.

SNOW GUARDS

See Guards, Snow

SOLDER

Air Reduction Sales Co., New York City.
• Allen Co., Inc., L. B., Chicago (Aluminum, Copper, Galv. Iron, and Stainless).
Alpha Metals Inc., Brooklyn (Silver & Tin-Lead).
• American Brass Co., Waterbury, Conn.
• American Smelting & Refining Co., New York City (Lead-Silver and Silver).
American Solder & Flux Co., Philadelphia (paste).
Belmont Smelting & Refining Works, Inc., Brooklyn (all kinds).
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., New York City.
Eagle-Picher Co., Cincinnati (Bar and Wire).
Eastern States Supply Co., Brooklyn.
Empire Metal Co., Syracuse, N. Y.
Farrelloy Company, Inc., Philadelphia.
Flemm Lead Co., Inc., Long Island City.
Galv-Weld Products, Dayton, O. (Repair)
Gardiner Metal Co., Chicago.
Glaser Lead Co., Inc., Brooklyn.
Handy & Harman, New York City (silver).
Industrial Service Laboratories, Milwaukee.
• Johnson Co., Lloyd S., Chicago.
Kester Solder Co., Chicago (Bar, Solid, Self-Fluxing Wire).

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Klauer Mfg. Co., Dubuque, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
• Lukens Metal Co., Thos. F., Philadelphia.
Merchant & Evans Co., Philadelphia.
Motex Metal Process Corporation, Detroit.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Rochester Lead Works, Rochester, N. Y.
• Ruby Chemical Co., Columbus, O. (Acid and Rosin Core).
• Ryerson & Son, Inc., Joesph T., Chicago.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Standard Rolling Mills, Inc., Brooklyn.

SOLDERING COPPERS
See Coppers, Soldering

SOLDERING FLUX
See Flux, Soldering

SOLDERING FURNACES
See Furnaces, Soldering

SOLDERING IRONS
See Coppers, Soldering

SOLDERING TORCHES
See Torches, Soldering

SOLENOID VALVES
See Valves, Solenoid

SOUND LEVEL INDICATORS
See Indicators, Sound Level

SPOT WELDERS
See Welders, Spot

SPRAY GUNS
See Guns, Spray

SQUARING MACHINES
See Machines, Squaring

STAMPINGS, METAL
Ackermann Manufacturing Company, Wheeling, W. Va.
Ames Co., W. R., San Francisco.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stainless)
Bossert Company, Inc., Utica, N. Y.
Brasco Manufacturing Co., Harvey, Ill.
Burgess-Norton Mfg. Co., Geneva, Ill.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago (Rings).
Commercial Shearing & Stamping Co., Youngstown, O.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Dayton Rogers Mfg. Co., Minneapolis.
Detroit Stamping Co., Detroit.
Downs-Smith Brass & Copper Co., Inc., New York City.
Edwards Mfg. Co., Inc., Cincinnati.
Friedley-Voshardt Co., Chicago.
General Metal Products Co., St. Louis.
Geometric Stamping Co., Cleveland.
Geuder, Paeschke & Frey Co., Milwaukee.
Gillian Mfg. Co., Detroit.
Globe Stamping Div., Hupp Motor Car Corp., Cleveland.
Globe Machine & Stamping Co., Cleveland.
Grammes & Sons, Inc., L. F., Allentown, Pa.
H P L Manufacturing Co., Cleveland.
Kirk & Blum Mfg. Co., Cincinnati.
Lukens Steel Company, Coatesville, Pa.
Maysteel Products, Inc., Milwaukee.
Miller & Doing, Brooklyn.
• Morrison Products, Inc., Cleveland.
• Morrison Steel Products, Inc., Buffalo.
Mullins Mfg. Co., Warren, O.
• National Metal Fabricators, Chicago.
New Delphos Manufacturing Co., Delphos, O.
New Monarch Machine & Stamping Co., Des Moines, Ia.
Niles Steel Products Div., Republic Steel Corp., Niles, O.
Osborn Co., J. M. & L. A., Cleveland, O.
Overly Manufacturing Co., Greensburg, Pa.
• Revere Copper & Brass, Inc., New York City.
Service Machine Co., Elizabeth, N. J.
Stafford Co., N., Brooklyn.
Standard Pressed Steel Co., Jenkintown, Pa.
Standard Stamping & Perforating Co., Chicago.
Tannewitz Works, Grand Rapids, Mich.
Truscon Steel Co., Youngstown, O.
• United States Register Co., Battle Creek, Mich.
• Waterman-Waterbury Co., Minneapolis.
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.
Worcester Pressed Steel Co., Worcester, Mass.
York Corrugating Co., York, Pa.

STAMPINGS, STEEL FURNACE
Ackermann Manufacturing Company, Wheeling, W. Va.
Commercial Shearing & Stamping Co., Youngstown, O. (Flanged and Dished Heads for Furnace Domes, Radiator Crescent Heads, Hat Pipes).

STEEL FRAMING
See Framing, for Housing Assemblies

STERILIZERS, AIR
See Units, Sterilizing, Air

STOKER CONTROLS
See Controls, Stoker

STOKER DRIVES
See Drives, Stoker

STOKER SCREWS OR WORMS
See Screws, Feed, Stoker

STOKERS, DOMESTIC
(Up to 61 lb. per hr.)
Advance Appliance Co., Inc., Peoria, Ill.
Air Conditioning & Stokers, Inc., St. Louis.
Allen Stoker Co., Allentown, Pa.
• American Furnace Co., St. Louis.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Bardes Range & Foundry Co., E. H., Cincinnati.
Beckley Perforating Co., Garwood, N. J. (Anthracite).
Black Servant Stoker Co., St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Brownie Stoker Co., Decatur, Ill.
Brownell Co., Dayton, O.
Bryant Heater Co., Cleveland. (Coke)
Burnham Stoker Co., Vancouver, Wash.
Burnwell Corp., Allentown, Pa.
Butler Street Foundry & Iron Co., Chicago.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
• Catskill Metal Works, Inc., Catskill, N. Y.
Central Rubber & Steel Corp., Findlay, O.
Chicago Automatic Stoker Co., Inc., Chicago.
Coal-O-Matic Stoker Company, Trucksville, Pa. (Anthracite).
• Conco Engineering Works, Mendota, Ill.
Consolidated Industries, Inc., Lafayette, Ind.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).
• Cotta Transmission Co., Rockford, Ill.
Davy Fuel & Supply Co., Stoker Div., Detroit (Bituminous).
Delco Appliance Div., General Motors Corp., Rochester, N. Y. (Bituminous).
Diamond Iron Works, Inc., Minneapolis.
Dickson Coal Co., New York City.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Eddy Stoker Corp., Chicago.
Electric Furnace-Man, Inc., Emmaus, Pa.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Fairbanks, Morse & Co., Chicago.
Fire-King Stoker Co., Indianapolis, Ind.
Foy Stoker Mfg. Co., Chicago.
Freed Heater & Stoker Company, Collegeville, Pa. (Anthracite).
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis
Fuel Savers, Inc., Harrisburg, Pa.
• Gehl Bros. Mfg. Co., West Bend, Wis.
General Machine Co., Inc., Emmaus, Pa.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Heating Assurance, Spokane, Wash.
Hemp & Co., Inc., Macomb, Ill.
Heritage Coal & Stoker Co., Chicago.
Hershey Machine & Foundry Co., Manheim, Pa.
• Hess Warming and Ventilating Co., Chicago.
Holcomb & Hoke Mfg. Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
• Illinois Iron & Bolt Co., Chicago.
Iron Fireman Mfg. Co., Cleveland.
Jacobson Machine Works, Inc., A. E., Minneapolis.
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.
Keith Furnace Co., Des Moines, Ia.
Kingston Products Corporation, Kokomo, Ind.
Kol-Master Corp., Oregon, Ill.
Leas Co., H. Leslie, Monona, Ia.
Link-Belt Co., Chicago.
Malco Gear Co., Dolton, Ill.
• Meyer Furnace Co., Peoria, Ill.
Muncie Gear Works, Inc., Muncie, Ind.
Murray Corporation of America, Detroit.
National Steam Pump Co., Upper Sandusky, O.
National Stoker Co., Inc., St. Louis (Bit.)
• Nelson Bros. & Strom Co., Racine, Wis.
Northern Steel & Stoker Corp., Peoria, Ill.
• Peerless Mfg. Co., Louisville, Ky.
Plymouth Industries, Inc., Plymouth, Ind.
• Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
Racine Stoker Mfg. Co., Racine, Wis.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Riddell, Inc., W. A., Frederick, Md.
Round Oak Co., Dowagiac, Mich.
• Rudy Furnace Co., Dowagiac, Mich.
• Schwab Furnace Co., Milwaukee, Wis.
• Schwab Safe Co., Lafayette, Ind.
Scott Engineering Co., Noblesville, Ind.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Scott-Newcomb, Inc., St. Louis.
Sinker-Davis Co., Indianapolis.
Smith Corporation, A. O., Milwaukee.
Souther Iron Co., E. E., St. Louis.
Steel Products Engineering Co., Springfield, O.
Stewart-Rogers, Inc., Philadelphia (Anthracite).
• Stokol Stoker Co., Inc., Indianapolis.
• Stok-A-Fire Co., Inc., University City, Mo.
Stoker-Lad Co., Tacoma, Wash.
Stoker Products, Inc., Decatur, Ill.
Sun-Fire Stoker Corp., New Albany, Ind.
Tropic-Air Stoker Co., Canton, O.
• U. S. Machine Corporation, Lebanon, Ind.
• Viking Manufacturing Corporation, Cleveland.
Wayne Oil Burner Co., Fort Wayne, Ind.
Whiting Stoker Sales Co., Chicago.
Will-Burt Co., Orrville, O.

STOKERS, INDUSTRIAL AND COMMERCIAL

(61 lb. to 300 lb. per hr.)

Advance Appliance Co., Inc., Peoria, Ill.
American Coal Burner Co., Chicago, Ill.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Babcock & Wilcox Co., New York City.
Black Servant Stoker Co., St. Louis.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Brownell Co., Dayton, O.
Burke Stoker & Mfg. Co., Chicago.
Burnham Stoker Co., Vancouver, Wash.
Butler Street Foundry & Iron Co., Chicago.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
• Catskill Metal Works, Inc., Catskill, N. Y.
Central Rubber & Steel Corp., Findlay, O.
Chicago Automatic Stoker Co., Inc., Chicago.
Coal-O-Matic Stoker Co., Trucksville, Pa. (Anthracite).
• Conco Engineering Works, Mendota, Ill.
Consolidated Industries, Inc., Lafayette, Ind.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).
• Cotta Transmission Co., Rockford, Ill.
Crown Iron Works, Minneapolis.
Detroit Stoker Co., Detroit and Monroe, Mich.
Diamond Castings Co., Johnsonburg, Pa.
Diamond Iron Works, Inc., Minneapolis (Ind.)
Eddy Stoker Corp., Chicago.
Electric Furnace-Man, Inc., Emmaus, Pa.
Fairbanks, Morse & Co., Chicago.
Firemood Machine Wks., Converse, Ind.
Flynn & Emrich Co., Baltimore.
• Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Fuel Savers Inc., Harrisburg, Pa.
• Gehl Bros. Mfg. Co., West Bend, Wis.
General Machine Co., Inc., Emmaus, Pa.
General Machinery Co., Spokane, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
Grossenbacher Furnace Co., Inc., St. Louis.
• Hall-Neal Furnace Co., Indianapolis, Ind.
Hare Stoker Corp., Detroit.
Heating Assurance, Spokane, Wash.
Hemp & Co., Inc., Macomb, Ill.
Heritage Coal & Stoker Co., Chicago.
Hershey Machine & Foundry Co., Manheim, Pa.
Holcomb & Hoke Mfg. Co., Indianapolis.
• Illinois Iron & Bolt Co., Chicago.
International Engineering Wks., Inc., Framingham, Mass.
Iron Fireman Mfg. Co., Cleveland.
Jacobson Machine Works, Inc., A. E., Minneapolis.
Kingston Products Corporation, Kokomo, Ind.
Kol-Master Corp., Oregon, Ill.
Leas Co., H. Leslie, Monona, Ia.
Leffel & Co., James, Springfield, O.
Link-Belt Co., Chicago.
Mallory Sales Co., Dolton, Ill.
• Meyer Furnace Co., Peoria, Ill.
Muncie Gear Works, Inc., Muncie, Ind.
National Steam Pump Co., Upper Sandusky, O.
National Stoker Company, Inc., St. Louis (Bit.)
Neemes Foundry Inc., Troy, N. Y.
• Nelson Bros. & Strom Co., Racine, Wis.
Northern Steel & Stoker Corp., Peoria, Ill.
Ormsby-Osterman Co., St. Louis.
Over-Spred Stoker Co., Chicago.
Patterson Foundry & Machine Co., East Liverpool, O.
Perfection Grate & Stoker Co., Springfield, Mass.
Plymouth Industries, Inc., Plymouth, Ind.
• Pocahontas Fuel Co., Inc., Cleveland.
Racine Stoker Mfg. Co., Racine, Wis.
• Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.
Riley Stoker Corp., Worcester, Mass.
Riddell, Inc., W. A., Frederick, Md.
Rosedale Fdry. & Mach. Co., N. S., Pittsburgh.
• Rudy Furnace Co., Dowagiac, Mich.
• Schwab Safe Co., Lafayette, Ind.
Scott-Newcomb, Inc., St. Louis.
Sinker-Davis Co., Indianapolis.
Steel Products Engineering Co., Springfield, O.
• Stok-A-Fire Co., Inc., University City, Mo.
Stoker Products, Inc., Decatur, Ill.
• Stokol Stoker Co., Inc., Indianapolis, Ind.
Sun-Fire Stoker Corporation, New Albany, Ind.
Taylor Engineering Co., Cincinnati.
Tropic-Air Stoker Co., Canton, O.
• U. S. Machine Corporation, Lebanon, Ind.
Wayne Oil Burner Co., Fort Wayne, Ind.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Whiting Stoker Sales Co., Chicago.
Whitty Company, Inc., Boston. (Bituminous)
Will-Burt Co., Orrville, O.
Woolley Engineering Co., Detroit.

STOVES

See Heaters

STRAINERS, CONDUCTOR

See Fittings and Accessories, Conductor

STRAPS, LEADER

See Fittings and Accessories, Conductor

SWITCHES, MAGNETIC

Allis-Chalmers Mfg. Co., Milwaukee.
Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Automatic Switch Co., New York City.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Company, Rockford, Ill.
Clark Controller Co., Cleveland.
Cook Electric Co., Chicago.
Cutler-Hammer, Inc., Milwaukee.
• Detroit Lubricator Co., Detroit.
Dunn Inc., Struthers, Philadelphia.
Electric Controller & Mfg. Co., Cleveland.
• General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago.
H-B Instrument Co., Inc., Philadelphia.
Hart Mfg. Co., Hartford, Conn. (Mercury Tube).
Industrial Engineering Corp., Terre Haute,, Ind.
• McDonnell & Miller, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Monitor Controller Co., Baltimore.
Palmer Electric Co., Chicago.
• Paragon Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.
Square D Co., Detroit.
Struthers-Dunn, Inc., Philadelphia.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
• White-Rodgers Electric Co., St. Louis.
Zenith Electric Co., Chicago.

SWITCHES, MANUAL

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee.
Dual Remote Control Co., Wayne, Mich.
Durakool, Inc., Elkhart, Ind. (Mercury).
Electric Controller & Mfg. Co., Cleveland, O.
• General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
Square D Co., Detroit.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

SWITCHES, TIME

Allen-Bradley Company, Milwaukee.
Au-Temp-Co. Corp., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Electric Co., Schenectady, N. Y.
• Gleason-Avery, Inc., Auburn, N. Y.
Healy Ruff Co., St. Paul, Minn.
Industrial Engineering Corp., Terre Haute, Ind.
International Register Co., Chicago.
Landis & Gyr, Inc., New York City.
• Mercoid Corp., Chicago.
Miller Heat-O-Meter Co., Milwaukee.
• Minneapolis-Honeywell Regular Co., Minneapolis.
National Time & Signal Corp., Detroit.
• Paragon Electric Co., Chicago.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Photoswitch, Inc., Cambridge, Mass.
Reliance Automatic Lighting Co., Racine, Wis.
Reynolds Electric Co., Chicago.
Rhodes, Inc., M. H., Hartford, Conn.

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• Sampsel Time Control, Inc., Spring Valley, Ill.
Sangamo Electric Co., Springfield, Ill.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
• White-Rodgers Electric Co., St. Louis.
Zenith Electric Company, Chicago.

TANK HEADS

See Parts for Heating and Air Conditioning Equipment

TEES, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

TEMPERATURE CONTROLS

See Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TIMING MACHINES

See Motors, Timing

TINNING

See Baths, Tinning

TINPLATE

See Sheets, Tin

TIPS, DAMPER

See Clips and Tips, Damper

THERMOMETERS, INDICATING

Bacharach Industrial Instrument Co., Pittsburgh.
Barclay, Inc., Robert, Chicago (Flue Gas).
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia.
Cooper Oven Thermometer Co., Pequabuck, Conn.
Defender Instrument & Regulator Co., St. Louis.
Dickson Co., Chicago.
Fee & Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York City.
H-B Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
Illinois Testing Laboratories, Inc., Chicago.
Leeds & Northrup Co., Philadelphia.
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Marsh Corporation, Jas. P., Chicago.
• Marshalltown Manufacturing Co., Marshalltown, Ia.
Mason-Neilan Regulator Co., Chicago. (Dial)
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Company, Chicago (Dial).
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Rochester Mfg. Co., Rochester, N. Y. (Dial).
Sarco Company, Inc., New York City.
Scientific Instrument Co., Detroit.
Standard Thermometer, Inc., Boston.
Tagliabue Div., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
United States Gauge Co., New York City.
Weksler Thermometer Corp., New York City.
Weston Electrical Instrument Corp., Newark, N. J.

THERMOSTATS, DAY AND NIGHT, CLOCK

Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Crown Controls Company, New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
• General Controls Co., Glendale, Calif.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regular Co., Minneapolis, Minn.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarcotherm Controls, Inc., Chicago.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, HEAT ACCELERATED OR ANTICIPATING

• Automatic Products Co., Milwaukee.
Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Cook Electric Co., Chicago.
Crown Controls Company, New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
Friez Instrument Division, Towson, Md.
Fulton Sylphon Co., Knoxville, Tenn.
• General Controls Co., Glendale, Calif.
H-B Instrument Co., Inc., Philadelphia, Pa.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regular Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
Precision Thermometer and Instrument Co., Philadelphia.
Sarcotherm Controls, Inc., Chicago.
Spencer Thermostat Co., Attleboro, Mass.
Tagliabue Div., C. J., Brooklyn.
Thrush & Co., H. A., Peru, Ind.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, LINE VOLTAGE

Allen-Bradley Co., Milwaukee.
American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
• Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal, Inc., Ashland, Mass.
Friez Instrument Division, Towson, Md.
• General Controls Co., Glendale, Calif.
H-B Instrument Co., Inc., Philadelphia.
Henry Company, Paul, Los Angeles.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Ranco Inc., Columbus, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Sarcotherm Controls, Inc., Chicago.
Spencer Thermostat Co., Attleboro, Mass.
Thrush & Co., H. A., Peru, Ind.
United Electric Controls Co., South Boston, Mass.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, LOW VOLTAGE

Allen-Bradley Co., Milwaukee.
American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.
Cook Electric Co., Chicago, Ill.
• Crise Electric Mfg. Co., Columbus, O.
Crown Controls Company, New Bremen, Ohio.
• Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Intrument Div., West Orange, N. J.
Friez Instrument Division, Towson, Md.
• General Controls Co., Glendale, Calif.
• Gleason-Avery, Inc., Auburn, N. Y.
H-B Instrument Co., Inc., Philadelphia.
Henry Co., Paul, Los Angeles.
McCorkle Co., D. H., Berkeley, Calif.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.
• Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
• Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Spencer Thermostat Co., Attleboro, Mass.
Thrush & Co., H. A., Peru, Ind.
United Electric Controls Co., South Boston, Mass.
• White Manufacturing Co., St. Paul, Minn.
• White-Rodgers Electric Co., St. Louis.

THERMOSTATS, MODULATING OR PROPORTIONING

Atlas Valve Company, Newark, N. J. (Air Operated).
Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Defender Instrument & Regulator Co., St. Louis.
H-B Instrument Co., Inc., Philadelphia.
Johnson Service Company, Milwaukee.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Tagliabue Div., C. J., Brooklyn.
• White Manufacturing Co., St. Paul, Minn.

THROUGH WALL FLASHINGS

See Flashings, Through Wall

TIME SWITCHES

See Switches, Time

TIMERS, WELDING

Automatic Temperature Control Co., Inc., Philadelphia.
Electronic Products Co., Geneva, Ill.
• Sciaky Bros., Chicago.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

TIMING MACHINES

See Machines, Timing, for Stoker Controls

TIMING MOTORS

See Motors, Timing

TINNING FLUXES

See Compounds, Tinning

TOGGLE BOLTS

See Bolts, Toggle

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

TOOLS, FIRING

• Adams Company, The, Dubuque, Ia. (Clinker Tongs, Rakes, Hoes, Pokers, Ash Removers for Stokers).
Apfel & Company, Hamilton, O. (Pokers, Rakes, Lighters, Clinker Tongs).
Farrell-Cheek Steel Company, Stoker Parts Div., Sandusky, O. (Clinker Tongs, Rakes, Hooks, Slice Bars, Pokers, Back-up Wrenches).
• Northwestern Stove Repair Co., Chicago.
Roesch & Associates, Inc., Syracuse, N. Y.
Stratton & Terstegge Co., Louisville, Ky. (Clinker Tongs).

TOOLS, METAL WORKERS'

• Barth Mfg. Co., Millidale, Conn.
Berridge Shear Co., Sturgis, Mich. (Pipe Crimpers and Snips)
• Bruno Tools, Beverly Hills, Calif. (Expansive Bit)
C-B Tool Co., Lancaster, Pa. (Rivet Cutter, Drill Savers).
Carboloy Company, Inc., Detroit. (Concrete Drills)
• Champion Tool Co., Los Angeles (Pipe Crimper).
• Cherry Rivet Co., Los Angeles (Rivet Gun—pneumatic and hand operated)
• Chicago Precision Equipment Co., Chicago, Ill. (Drill head)
Circo Tool Co., Milwaukee. (Hole Cutters)
Cleveland Pneumatic Tool Co., Chicago. (Cleco Sheet Holders)
• Crandall Mfg. Co., Los Angeles. (Drill Grinders)
• Crescent Tool Co., Jamestown, N. Y. (Scratch Awls, Pliers, Pullers, Screw-drivers).
• Damascus Steel Products Corporation, Rockford, Ill. (Punches, Chisels, Star Drills, Nippers, Drills, Screw Drivers)
Downs-Smith Brass & Copper Co., Inc., New York City. (Hammers)
Fairmount Tool & Forging Co., Cleveland. (Caulking irons, file holders, pliers, solder paddle, chisels, punches, hammers)
Frayn & Co., N. J., Redwood City, Calif. (Hole cutters)
Greenlee Tool Co., Rockford, Ill. (Pipe Benders, Screw Drivers)
Grobet File Corp. of America, New York City (Files).
Haines Gauge Company, Inc., Philadelphia (Thickness Gauges).
Horst Mehl Mfg. Co., New York. (Screw Clamps)
Howes-Woods Co., Cambridge, Mass. (Hack Saw Blades)
Hub Specialty Co., Somerville, Mass. (Awl).
• Independent Pneumatic Tool Co., Chicago. (Elec. screw drivers, nut setters, tappers)
Interstate Sales Co., New York City (Angle Meters, Circle Meters, Divizor, Mechanic's Protractor).
Jewel Mfg. Co., St. Paul, Minn. (Welding Clamps)
Johnson, Inc., Wm., Newark, N. J. (Tinners' Rivet Sets)
Johnson Ladder & Shoe Co., Eau Claire, Wis. (Ladder Shoes).
Lyon Metal Products, Inc., Aurora, Ill. (Stock Cart, work bench, tool stands)
Martin Co., Glenn L., Baltimore, Md. (Tubing Bender)
Mid-States Equipment Co., Chicago. (Power Saw)
Millers Falls Co., Greenfield, Mass. (Hack Saws).
Misener Mfg. Co., Inc., Syracuse, N. Y. (Rotary Hack Saw and Blades, and Hole Saw for Metal and Wood).
Mutual Liquid Gas & Equipment Co., Inglewood, Calif. (Blowtorch)
Myers Ladder Equipment Company, Madison, Wis. (Ladder Brackets).
• Niagara Machine & Tool Works, Buffalo.
Nork Products Co., Los Angeles. (Scribers, Dividers, Calipers, Wiggler)
Packham Crimper Co., Mechanicsburg, O. (Crimping Tongs).
• Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia (Punches, Chisels and Edge Tools).
Phillips Drill Co., Chicago (Anchor Bolt Drill).
Poe, Ralph W., Canton, Ill. (Sheet Metal Cutters).
Reimuller Bros. Co., Franklin Park, Ill. (Hydraulic Vises)
• Reiner & Campbell Co., Inc., Elizabeth, N. J. (Dividers)
Scherr Co., Inc., George, New York City. (Micrometers)
• Skilsaw, Inc., Chicago. (Portable Saws)
Snap-On Tools Corp., Kenosha, Wis. (Hammers, Screw Drivers, Chisels, Punches, Soldering Irons and Pliers, Hack Saws, Drills, Files, Bolt Cutters, Metal Shears, Tin Snips, Vises, Grinders)
Stanley Tools, New Britain, Conn. (Punches, Rules, Cold Chisels, Levels, Bit Braces, Squares, Screwdrivers, Bars)
Stortz & Son., Inc., John, Philadelphia. (Punches)
Stow Manufacturing Co., Binghamton, N. Y. (Flexible shaft drills)
Topflight Tool Co., Huber Bldg., York, Pa. (Jigs, Riveters, Dimplers, Rivet Pullers)
Vulcan Electric Co., Danvers, Mass. (Electric Soldering Irons, Solder Pots, Glue Pots).
Wales-Strippit Corporation, North Tonawanda, N. Y. (Hole Punching and Notching Units)
• Whitney Mfg. Co., W. A., Rockford, Ill.
• Whitney Metal Tool Co., Rockford, Ill. (Aircraft Rivet Squeezer).

TOOLS, ROOFERS'

• Adams Company, Dubuque, Ia. (Scaffold Brackets).
Aeroil Products Company, West New York, N. J. (Melting Kettles, Hoists, Buckets, Tools and Accessories)
Ajax Building Bracket Co., Cleveland Heights, O. (Brackets).
All States Roofers Equip. & Mat'l Co., Chicago (Complete Line).
Belden Machine Company, New Haven, Conn. (Hammer, Ripper, Stake & Punch).
Connery Construction Co., Philadelphia. (Kettles)
Eastern States Supply Co., Brooklyn (Mops, Hoist Wheel, Buckets, Dippers, Slaters' Tools, Tin Discs).
Elermann Floor Scraper Co., York, Pa. (Roof Scrapers)
• Frey & Co., Frank P., Chicago.
Hauck Manufacturing Co., Brooklyn (Asphalt and Pitch Kettles).
Littleford Bros., Inc., Cincinnati.
• Milcor Steel Co., Milwaukee.
Mohawk Asphalt Heater Co., Frankfort, N. Y. (Kettles)
• Peck, Stow & Wilcox Co., Southington, Conn.
Southbridge Roofing Company, Inc., Southbridge, Mass. (Scrapers, gravel spreaders, tinners' firepots, buckets, kettles).
Sperry & Co., D. R., Batavia, Ill. (Kettles)
Stortz & Son., Inc., John, Philadelphia. (Poker, hoe, bar)
Structural Slate Co., Pen Argyl, Pa. (Hammer, Ripper and Stake, also Portable Machine Cutter and Punch).

TOPS, CHIMNEY

See Caps and Tops, Chimney

TORCHES, BRAZING, CUTTING, WELDING, ELECTRIC

Borm Manufacturing Company, Elgin, Ill.
Ergolyte Manufacturing Co., Philadelphia.
General Scientific Equipment Co., Philadelphia.
Hammett Electric Mfg. Co., Kansas City, Mo.
Marquette Mfg. Co., Inc., Minneapolis.
Mid-States Equipment Co., Chicago.
National Cylinder Gas Co., Chicago.
Will-Weld Manufacturing Co., Omaha, Nebr.

TORCHES, BRAZING, CUTTING, WELDING, OXY-ACETYLENE

Aeroil Burner Co., Inc., West New York, N. J.
Air Reduction Sales Co., New York City.
Atkins and Company, Inc., E. C., Indianapolis.
Bastian-Blessing Co., Chicago.
Bernz Co., Otto, Rochester, N. Y. (Brazing).
Black Manufacturing Co., Baltimore, Md.
Burdett Mfg. Co., Chicago.
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Dockson Corporation, Detroit.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Manufacturing Co., Philadelphia.
General Scientific Equipment Co., Philadelphia.
Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Linde Air Products Co., The, New York City.
Marquette Manufacturing Co., Inc., Minneapolis.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Trindl Products, Ltd., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Company, San Francisco.
Wall Chemical Div., Liquid Carbonic Corp., Chicago.
Welding Apparatus Co., Chicago.

TORCHES, SOLDERING

American Gas Furnace Co., Elizabeth, N. J.
Bastian-Blessing Co., Chicago.
Bernz Co., Otto, Rochester, N. Y.
Choate Mfg. Co., Cincinnati.
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Detroit Torch & Mfg. Co., Detroit.
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Everhot Mfg. Co., Maywood, Ill.
General Scientific Equipment Co., Philadelphia.
Harris Calorific Co., Cleveland.
Ideal Commutator Dresser Co., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago.
Insto-Gas Corporation, Detroit.
• Johnson Gas Appliance Co., Cedar Rapids, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Ransome Company, Emeryville, Calif.
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Cedar Rapids, Ia.
Sanders, J. A., Fulton, N. Y.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago. (Gasoline, Kerosene)
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Wall Mfg. Supply Co., P. N. S. Pittsburgh.
Welding Apparatus Co., Chicago.

TRANSFORMERS, IGNITION

Davis & Co., Inc., Dean W., Chicago.
General Electric Co., Schenectady, N. Y.
Harvey, Inc., Sid, Valley Stream, N. Y.
Jefferson Electric Company, Bellwood, Ill.
Webster Electric Co., Racine, Wis.

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TRANSFORMERS, LOW VOLTAGE

• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.
Davis & Co., Inc., Dean W., Chicago.
• Detroit Lubricator Co., Detroit.
• General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Ideal Commutator Dresser Co., Sycamore, Ill.
Jefferson Electric Co., Bellwood, Ill.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
Taylor-Winfield Corp., Warren, O.
Wagner Electric Corp., St. Louis.
Webster Electric Co., Racine, Wis.
Westinghouse Electric Corporation, East Pittsburgh, Pa.

TRANSMISSIONS, VARIABLE SPEED

Allis-Chalmers Mfg. Co., Milwaukee.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Link-Belt Company, Chicago.
Lewellen Mfg. Co., Columbus, Ind.

TRIM, ORNAMENTAL

See Moulding and Trim, Ornamental

TUBING, ALUMINUM

Aluminum Company of America, Pittsburgh.
Brasco Mfg. Co., Harvey, Ill.
Lewin-Mathes, Lewin Metals Div., St. Louis.
• Revere Copper & Brass, Inc., New York City.

TUBING, COPPER

Allegheny-Ludlum Steel Corporation, Brackenridge, Pa. (Stainless)
• American Brass Co., Waterbury, Conn.
Brasco Mfg. Co., Harvey, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., Inc., New York City.
• Hussey & Co., C. G., Pittsburgh.
Imperial Brass Mfg. Co., Chicago.
International Nickel Co., New York City. (Nickel, Monel, Inconel)
Lewin-Mathes Company, Lewin Metals Div., St. Louis.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., British American Tube Div., New York City.
• Revere Copper & Brass Incorporated, New York City.
Roberts Tube Works, Detroit.
Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.

TUBING AND FITTINGS, PLASTIC

Acadia Synthetic Products Division, Chicago.
Carter Products Corp., Cleveland.
Commercial Plastics Co., Chicago.
Extruded Plastics, Inc., Norwalk, Conn.
Firestone Tire & Rubber Co., Akron, O.
General Electric Co., Plastics Div., Pittsfield, Mass.
Goodrich Co., B. F., Akron, O.
Hodgman Rubber Co., Framingham, Mass.
Irvington Varnish and Insulator Co., Irvington, N. J.
Mills Corp., Elmer E., Chicago.
North Penn Co., New York City.
Parker Appliance Co., Cleveland.
Resistoflex Corp., Belleville, N. J. (Synthetic)
Sandee Mfg. Co., Chicago.
• Skuttle Manufacturing Co., Detroit.
Technical Processes Div., Colonial Alloys Co., Philadelphia.
United States Stoneware Co., Akron, O., and New York City.
Yardley Plastics Company, Columbus, O.

UNITS, AIR CONDITIONING

See Air Conditioning Units

UNITS, FUEL FOR OIL BURNERS

Kraissl Company, Inc., Hackensack, N. J.
Monarch Manufacturing Works, Inc., Philadelphia.
Sundstrand Pump Division, Rockford, Ill.
Webster Electric Co., Racine, Wis.

UNITS, STERILIZING, AIR

Rogers, Diesel & Aircraft Corporation, New York.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Manufacturing Co., Chicago.
American Air Conditioning Co., Detroit.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Circulators & Devices Mfg. Corp., New York.
Ilg Electric Ventilating Co., Chicago.
Kaiser Co., H. S., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Meier Electric & Machine Co., Indianapolis, Ind.
Mellish & Murray Co., Chicago.
Reed Unit-Fans, Inc., New Orleans.
Reliable Sheet Metal Engineering Co., Chicago.
Somers, Inc., H. J., Detroit.
Trade-Wind Motorfans, Inc., Los Angeles.
Unified Air Conditioner Co., Duluth, Minn.
Utility Appliance Corporation, Los Angeles.
Vita-Screen Ventilator Co., New York City.

VACUUM CLEANERS FOR FURNACES

See Cleaners, Vacuum, Furnace

VALVES, GAS PRESSURE REGULATING

Atlas Valve Co., Newark.
• Barber Gas Burner Co., Cleveland.
Belfield Co., H., Philadelphia.
Bryant Corp., C. L., Cleveland.
Cooper Co., Clark, Palmyra, N. J.
Davis Regulator Co., Chicago.
Defender Instrument & Regulator Co., St. Louis. (Chronometer)
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Fox Control & Mfg. Co., Cleveland.
Fulton Syphon Co., Knoxville, Tenn.
• General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.
Hotstream Heater Co., Cleveland.
Kieley & Mueller, Inc., North Bergen, N. J.
Klipfel Mfg. Co., Chicago.
Mason-Neilan Regulator Co., Dorchester, Mass.
• Mercoid Corp., Chicago.
Milwaukee Gas Specialty Company, Milwaukee.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Denver, Colo.
• Payne Furnace Co., Beverly Hills, Calif.
Reading-Pratt & Cady Div., American Chain & Cable Co., Inc., Reading, Pa.
Roberts-Gordon Appliance Corp., Buffalo.
Tagliabue Div., C. J., Brooklyn.
Trerice Co., H. O., Detroit.

VALVES, HUMIDIFIER, WATER LEVEL

• Badger Corporation, Milwaukee.
Barclay, Inc., Robert, Chicago.
Beckett & Co., Thomas, Dallas, Texas.
Belfield Co., H., Philadelphia.
Fisher Governor Co., Marshalltown, Ia.
G. & S. Tool Co., Detroit.
• General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.
Maid-O'-Mist, Inc., Chicago.
McAlear Mfg. Co., Chicago.
• McDonnell & Miller, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Morey, Dan, Los Angeles.
Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
• Skuttle Manufacturing Co., Detroit.
• Viking Air Conditioning Corp., Cleveland.

VALVES, SADDLE

See Fittings, Humidifier, Water Level

VALVES, SOLENOID

Adel Precision Products Corp., Burbank, Calif.
Alco Valve Co., St. Louis.
Au-Temp-Co Corp., New York City.
• Automatic Products Co., Milwaukee.
Automatic Switch Co., New York City.
Barber-Colman Co., Rockford, Ill.
Belfield Co., H., Philadelphia.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee.
Davis Regulator Co., Chicago.
• Detroit Lubricator Co., Detroit.
Electric Valve Mfg. Co., Inc., New York City.
Electrimatic Division, The Simonix Co., Chicago.
Frick Company, Waynesboro, Pa.
• General Controls Co., Glendale, Calif. (Magnetic)
General Electric Co., Schenectady, N. Y.
General Sales & Products Co., Cohoes, N. Y.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hubbell Corp., Chicago.
Hunt & Son, C. B., Salem, O.
Keckley Co., O. C., Chicago, Ill.
• McDonnell & Miller, Chicago.
• Mercoid Corp., Chicago.
Milwaukee Gas Specialty Company, Milwaukee.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
Parker Appliance Co., Cleveland.
• Payne Furnace Co., Inc., Beverly Hills, Calif.
• Penn Electric Switch Co., Goshen, Ind.
Pfening Co., Fred D., Columbus, O.
R-S Products Corporation, Philadelphia.
Ruggles-Klingemann Mfg. Co., Salem, Mass.
Sarco Co., Inc., New York City.

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Sarcotherm Controls, Inc., Chicago.
Sporlan Valve Co., St. Louis.
Square D Company, Detroit.
Supreme Electric Products Corp., Rochester, N. Y.
Vapor Car Heating Co., Inc., Chicago.
Wheelco Instruments Co., Chicago.

VANES, DUCT TURNING, PREFABRICATED

• Air Devices, Inc., New York City.
Barber-Colman Company, Rockford, Ill.
Stewart Manufacturing Co., Bloomfield, N. J. (Outlet Scoops)
• Tuttle & Bailey, Inc., New Britain, Conn.
• Waterloo Register Company, Waterloo, Ia.

VENTILATORS, CEILING

Airmaster Corp., Chicago.
• Auer Register Co., Cleveland.
Barber-Colman Company, Rockford, Ill.
Best Register Co., Milwaukee.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Decatur Iron & Steel Co., Decatur, Ala.
• Elgo Shutter & Manufacturing Co., Detroit.
Gillian Mfg. Co., Detroit.
• Hart & Cooley Mfg. Co., Holland, Mich.
Klauer Manufacturing Co., Dubuque, Ia.
• Milcor Steel Co., Milwaukee.
Miller & Doing, Brooklyn.
• Tuttle & Bailey, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.
Universal Blower Co., Birmingham, Mich.

VENTILATORS, MUSHROOM

• Aeolus Dickinson, Chicago.
Best Register Co., Milwaukee.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Knowles Mushroom Ventilator Co., Montclair, N. J.
Lumm Co., A. H., Toledo, O.
• Mueller Furnace Co., L. J., Milwaukee.
Penn Ventilating Co., Philadelphia.
Ventilating Products Co., Chicago.

VENTILATORS, ROOF, FAN

• Aeolus Dickinson, Chicago.
Aerovent Fan Co., Piqua, O.
• Air Conditioning Products Co., Detroit.
• Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
Aladdin Heating Corporation, Oakland, Calif.
Allen Corp., Detroit. (Turbine)
American Blower Corporation, Detroit.
American Coolair Corp., Jacksonville, Fla.
American-Larson Ventilating Co., Pittsburgh.
American Steel Band Co., Pittsburgh.
Arex Co., Chicago.
Belanger Fan & Blower Co., Detroit.
Bishop & Babcock Mfg. Co., Cleveland.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilating Co., New York City. (Turbine)
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Clay Equipment Corp., Cedar Falls, Ia.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Diehl Mfg. Company, Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Electrovent Fan & Mfg. Co., Chicago.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
• Gallaher Company, Owatonna, Minn. (Centrifugal)
Gehri Company, Tacoma, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Howes-Woods Company, Cambridge, Mass.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
Kernchen Co., Chicago.
King Ventilating Co., Owatonna, Minn.
Klauer Manufacturing Co., Dubuque, Ia.
Klee Co., George B., Cincinnati.
Lee & Son Co., Thomas, Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Martin Fan & Blower Co., Chicago.
Mellish & Murray Co., Chicago.
Mountain States Equipment Co., Denver, Colo.
Myers Electric Co., Pittsburgh.
• National Metal Fabricators, Chicago.
• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Overly Manufacturing Co., Greensburg, Pa.
Pennsylvania Wire Glass Co., Philadelphia.
Peerless Electric Co., Warren, O.
Penn Ventilating Co., Philadelphia.
Phoenix Ventilator Co., Brooklyn, N. Y.
Powermatic Ventilator Co., Cleveland.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans.
Robertson Co., H. H., Pittsburgh. (Round-Rectangular)
Royal Ventilator Co., Philadelphia.
• Schwitzer-Cummins Company, Indianapolis.
Shreveport Engineering Co., Inc., Shreveport, La.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Somers, Inc., H. J., Detroit.
• Swartwout Co., Cleveland.
Trade-Wind Motorfans, Inc., Los Angeles.
Trane Company, LaCrosse, Wis.
Trufio Fan Co., Harmony, Pa.
Uno Ventilator Co., Cliftondale, Mass. (Turbine)
Utility Appliance Corporation, Los Angeles.
Van Noorden Company, E., Boston.
• Viking Air Conditioning Corp., Cleveland.
Washburne & Co., E. G., New York City.
Waverly Heating Supply Co., Boston.
Western Engineering & Mfg. Co., Los Angeles.
Wind-Way Fan & Ventilator Co., Inc., New Orleans.
Wing Mfg. Co., L. J., New York City.
Winkler & Sons, Inc., A. E., Milwaukee.
Young Radiator Company, Racine, Wis.

VENTILATORS, ROOF, GRAVITY

• Accurate Mfg. Works, Chicago.
• Air Devices, Inc., New York City.
A-J Manufacturing Co., Kansas City, Mo.
• Aeolus Dickinson, Chicago.
• Air Control Products, Inc., Coopersville, Mich.
Allen Corp., Detroit. (Turbine)
American-Larson Ventilating Co., Pittsburgh.
American Metal Products, Fort Worth, Tex.
American Sheet Metal Works, New Orleans.
American Steel Band Co., Pittsburgh.
Ames Co., W. R., San Francisco.
Arex Co., Chicago.
Autoforce Ventilating System, Boston.
• Berger Bros. Co., Philadelphia.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Clay Equipment Corp., Cedar Falls, Ia.
• Clayton & Lambert Mfg. Co., Middletown, Ohio.
Danzer Metal Works Co., Hagerstown, Md.
Day Co., The, Minneapolis.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
Firecraft Corporation, Chicago.
Gehri Company, Tacoma, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Howes-Woods Company, Cambridge, Mass.
International Steel Co., Evansville, Ind.
Iona Ventilator Co., Inc., Philadelphia.
Iwan Brothers, South Bend, Ind.
Jamar Co., Walker, Duluth, Minn.
Jordan & Co., Paul R., Indianapolis.
Kernchen Co., Chicago.
King Ventilating Co., Owatonna, Minn.
Klauer Manufacturing Co., Dubuque, Ia.
Kleenaire Corp., Stevens Point, Wis.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lee & Son Co., Thomas, Cincinnati.
Leslie Welding Co., Chicago. (Slant Roof Louver)
• Levow, David, New York City.
Lumm Co., A. H., Toledo, O.
Lyon, Conklin & Co., Inc., Baltimore, Md.
Matt Coil-Less Burner Co., Chicago.
Mellish & Murray Co., Chicago.
Merchant & Evans Co., Philadelphia.
• Milcor Steel Co., Milwaukee.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Osborn Co., J. M. & L. A., Cleveland.
Overly Manufacturing Co., Greensburg, Pa.
Penn Ventilating Co., Philadelphia.
Pennsylvania Wire Glass Co., Philadelphia.
Phoenix Ventilator Co., Brooklyn, N. Y.
Pioneer Roofing & Sheet Metal Co., Muskogee, Okla.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H., Pittsburgh. (Monitor)
Royal Ventilator Co., Philadelphia.
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sioux Steel Co., Sioux Falls, S. D.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Souther Iron Co., E. E., St. Louis.
Standard Furnace & Supply Company, Omaha, Nebr.
Standard Ventilator Co., Lewisburg, Pa. (Rotary)

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Steinhorst & Sons, Inc., Emil, Utica, N. Y.
• Swartwout Co., Cleveland.
Tierney Rotor Ventilator Co., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Uno Ventilator Co., Cliftondale, Mass. (Turbine)
Van Noorden Company, E., Boston.
Western Engineering & Mfg. Co., Los Angeles.
• Willis Steel Corporation, Galesburg, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.
York Corrugating Co., York, Pa.

VENTILATORS, ROOF, RIDGE

• Accurate Mfg. Works, Chicago.
• Aeolus Dickinson, Chicago.
American-Larson Ventilating Co., Pittsburgh.
Arex Co., Chicago.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Firecraft Corporation, Chicago.
Gehri Company, Tacoma, Wash.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Klauer Manufacturing Co., Dubuque, Ia.
Overly Manufacturing Co., Greensburg, Pa.
Pennsylvania Wire Glass Co., Philadelphia.
Penn Ventilating Co., Philadelphia.
Robertson Company, H. H., Pittsburgh.
Royal Ventilator Co., Philadelphia.
Souther Iron Co., E. E., St. Louis.
• Swartwout Co., Cleveland.
Van Noorden Company, E., Boston.

VIBRATION ISOLATERS

See Bases and Pads

WARM AIR REGISTER SHIELDS

See Shields, Warm Air Register

WASHERS, AIR, HEATING AND VENTILATING

(Capacity 4,000 c.f.m. and up)

Air & Refrigeration Corp., New York City.
Airwasher Corporation, Lansing, Mich.
• Alton Manufacturing Co., Dallas, Tex.
American Blower Corp., Detroit.
Ames Co., W. R., San Francisco.
Ballantyne Co., Omaha, Nebr.
• Bayley Blower Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Centri-Spray Co., Detroit.
• Clarage Fan Co., Kalamazoo, Mich.
Columbus Heating & Ventilating Co., Columbus, O.
Drying Systems, Inc., Chicago.
Electrovent Fan & Mfg. Co., Chicago.
• Furbio Company, Hermansville, Mich.
International Sales Co., San Francisco.
Mellish & Murray Co., Chicago.
Mountain States Equipment Co., Denver, Colo.
Murray Manufacturing Co., D. J., Wausau, Wis.
New York Blower Co., Chicago.
Northern Blower Co., Cleveland.
Parks-Cramer Co., Fitchburg, Mass.
Peters-Dalton, Inc., Detroit.
Phillips Cooling Tower Co., Inc., New York City.
Schmieg Industries, Detroit.
Spray Engineering Co., Somerville, Mass.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Trane Co., La Crosse, Wis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
Vilter Mfg. Company, Milwaukee.
Western Blower Co., Seattle, Wash.
York Corp., York, Pa.

WATERPROOFING

Angier Corporation, Framingham, Mass.
Barrett Division, Allied Chemical & Die Corporation, New York City.
Cabot, Inc., Samuel, Boston.
Carey Mfg. Co., Philip, Lockland, O.
Cheesman-Elliot Co., Inc., Brooklyn, N. Y.
Eastern States Supply Co., Brooklyn.
• Elaterite Non-Metallic Products Co., Los Angeles.
Flintkote Co., New York City.
General Insulating Products Co., Brooklyn.
Glidden Company, Cleveland.
Horn Co., A. C., Long Island City, N. Y.
Johns-Manville Sales Corp., New York City.
Koppers Company, Inc., Pittsburgh.
Lehon Company, Chicago.
Nebel Manufacturing Co., Cleveland.
Reilly Tar & Chemical Corporation, Indianapolis, Ind. (Compounds)
Ruberoid Co., New York City.
Sisalkraft Co., Chicago.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Truscon Laboratories, Detroit.
X-Pando Corporation, Long Island City, N. Y.

WATERPROOFING COMPOUNDS

See Compounds, Waterproofing

WATER HEATERS

See Coils, Fire Pot, Hot Water

WELDERS, ARC

Air Reduction Sales Company, New York City.
Allied Weld Crafts, Inc., Indianapolis.
Allis-Chalmers Manufacturing Company, Milwaukee.
Borm Manufacturing Company, Elgin, Ill.
Coddington Manufacturing Co., E. D., Milwaukee.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Ergolyte Mfg. Co., Philadelphia. (A.C.)
• Fern, Ralph, Scanton, Pa.
General Equipment Co., Wichita, Kan.
General Electric Co., Schenectady, N. Y.
Glenn-Roberts Company, Oakland, Calif.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hampton Electric Mfg. Co., Oakmont, Pa.
Harnischfeger Corp., Milwaukee. (Electric)
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Hobart Brothers Co., Troy, O.
Hollup Corp., Div. National Cylinder Gas Co., Chicago.
Ideal Electric & Mfg. Co., Mansfield, O.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland.
Maple Valley Mfg. Co., Mapleton, Ia.
Marquette Manufacturing Co., Inc., Minneapolis. (A. C.)
Mid-States Equipment Co., Chicago.
Miller Electric Mfg. Co., Inc., Appleton, Wis. (Portable)
National Cylinder Gas Co., Chicago.
Nelson Specialty Welding Equipment Corp., San Leandro, Calif. (Stud welder)
Sight Feed Generator Co., Richmond, Ind.
Smith Corporation, A. O., Milwaukee.
Smith Welding Equipment Corp., Minneapolis.
Trindl Products, Ltd., Chicago.
Una Welding, Incorporated, Cleveland. (Automatic Shielded Arc Welding)
Universal Power Corporation, Cleveland.
Welding Apparatus Co., Chicago.
Westinghouse Electric Corporation, East Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A. C.)
Wilson Welder & Metals Co., Inc., New York City.

WELDERS, PROJECTION

• Acme Electric Welder Co., Los Angeles.
National Electric Welding Machines Co., Bay City, Mich.
Pier Equipment Mfg. Co., Benton Harbor, Mich.
• Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit.
Thompson-Gibb Electric Welding Co., Lynn, Mass.
Taylor-Winfield Corporation, Warren, O.
Welding Machines Mfg. Co., Detroit.

WELDERS, RESISTANCE

(Flash and Butt)

National Electric Welding Machines Co., Bay City, Mich.
• Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit. (Spot)
Taylor-Winfield Corporation, Warren, O.
Thompson-Gibb Electric Welding Co., Lynn, Mass.
Universal Power Corporation, Cleveland.

WELDERS, SEAM

National Electric Welding Machines Co., Bay City, Mich.
• Sciaky Bros., Chicago.
Swift Electric Welder Co., Detroit.
Thompson-Gibb Electric Welding Co., Lynn, Mass.
Universal Power Corporation, Cleveland.
Welding Machines Mfg. Co., Detroit.

WELDERS, SPOT

• Acme Electric Welder Co., Los Angeles.
Agnew Electric Co., Milford, Mich.
Alphil Spot Welding Co., New York City.
Coddington Manufacturing Co., E. D., Milwaukee.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Federal Machine & Welder Co., Warren, O.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Mallory & Co., Inc., P. R., Indianapolis, Ind.
Micro Products Co., Chicago.
National Electric Welding Machines Co., Bay City, Mich.
Pier Equipment Manufacturing Co., Benton Harbor, Mich. (Foot operated and motor driven)
Rex Welder and Engineering Co., Kansas City, Mo.
• Sciaky Bros., Chicago, Ill.
Swift Electric Welder Co., Detroit.
Taylor-Hall Welding Corp., Warren, Ohio.
Taylor-Winfield Corp., Warren, O. (Butt and Seam)
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Universal Power Corporation, Cleveland.
Weldex, Inc., Detroit.
Welding Machines Mfg. Co., Detroit.
Westinghouse Electric Corporation, East Pittsburgh.

WELDING COMPOUNDS

See Compounds, Welding

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

WELDING EQUIPMENT, ARC OR ELECTRIC

Atlas Welding Accessories Co., Detroit. (Weld Cleaning Tools)
Electroloy Company, Inc., Chicago. (Electrode Holders, Dressers and Weld Testers)
Eisler Engineering Co., Newark, N. J.
Hercules Electric & Mfg. Co., Inc., Brooklyn. (Magnetic Aligners)
Lincoln Electric Co., Cleveland. (Foot Operated Control)
Mid-States Equipment Co., Chicago. (Automatic Arc)
Miller Electric Mfg. Co., Inc., Appleton, Wis. (Electrode Holders, Helmets, Trucks)
Standard Machinery Company, Providence, R. I. (Positioner)
Tweco Products Co., Wichita, Kans. (Electrode Holders, Jig and Fixture Clamps)
Universal Power Corporation, Cleveland.

WELDING EQUIPMENT, OXY-ACETYLENE

Air Reduction Sales Co., New York City.
Allied Weld-Craft, Inc., Indianapolis.
Atlas Welding Accessories Co., Detroit.
Automatic Gasflux Mfg. Co., Mansfield, O.
Bastian-Blessing Co., Chicago.
Black Manufacturing Co., Baltimore.
Burdett Mfg. Co., Chicago.
Dockson Corporation, Detroit.
Ergolyte Manufacturing Co., Philadelphia.
Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Jewel Mfg. Co., St. Paul, Minn.
Linde Air Products Co., The, New York City.
Marquette Manufacturing Co., Inc., Minneapolis.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Ransome Machinery Co., Dunellen, N. J. (Welding Positioner)
• Reiner & Campbell Co., Inc., Elizabeth, N. J.
Sight Feed Generator Co., Richmond, Ind. (Generators)
Smith Welding Equipment Corp., Minneapolis.
Standard Machinery Company, Providence, R. I. (Positioner)
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Co., San Francisco.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.

WELDING ROD

See Rod, Welding

WELDING TORCHES

See Torches, Brazing, Cutting, Welding

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.
• Air Controls, Inc., Cleveland.
• Bayley Blower Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Products, Inc., Irvington, N. J.
• Clarage Fan Co., Kalamazoo, Mich.
Goetti Bros., Phoenix, Ariz.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Mfg. Co., Hastings, Nebr.
• Janette Mfg. Co., Chicago.
• Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago.
Mayne Products Co., Dayton, O.
• Morrison Products, Inc., Cleveland.
New York Blower Co., Chicago.
Peerless Electric Co., Warren, O.
• Schwitzer-Cummins Company, Indianapolis.
Sturtevant Co., B. F., Div. Westinghouse Electric, Boston.
Torrington Mfg. Co., Torrington, Conn.
Trane Company, La Crosse, Wis.
• Triangle Mfg. Co., Oshkosh, Wis.
• U. S. Air Conditioning Corp., Minneapolis.
Utility Appliance Corporation, Los Angeles.
• Viking Air Conditioning Corp., Cleveland.
Western Blower Company, Seattle, Wash.

WINDOW FANS

See Fans, Window

WINDOWS, HEAT INSULATING

Advance Insulating Co., Pittsburgh.
Andersen Corp., Bayport, Minn.
Chamberlin Company of America, Detroit.
Detroit Steel Products Co., Detroit.
Kane Mfg. Corp., Kane, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mississippi Glass Company, New York City.
Pittsburgh Plate Glass Co., Pittsburgh.
Russell Co., F. C., Cleveland.
Truscon Steel Co., Youngstown, O.

WINDOWS, HOLLOW METAL

American Sheet Metal Works, New Orleans.
Biersach & Neidermeyer Co., Milwaukee.
Edwards Manufacturing Co., Cincinnati.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Jamestown Metal Corp., Jamestown, N. Y.
Newman Brothers, Inc., Cincinnati.
Perkinson & Brown, Chicago.
Russell Co., F. G., Cleveland.
Truscon Steel Co., Youngstown, O.
• Willis Steel Corporation, Galesburg, Ill.

WIRE GLASS

See Glass, Wire

WIRE, PLAIN, GALVANIZED AND COPPERED

Allegheny Ludlum Steel Corp., Brackenridge, Pa. (Stainless)
Alpha Metals, Inc., Brooklyn, N. Y.
Aluminum Co. of America, Pittsburgh. (Aluminum)
American Nickeloid Co., Peru, Ill. (Chrome, nickel coated)
American Steel & Wire Co., Cleveland.
Angell Nail & Chaplet Co., Cleveland.
Atlantic Steel Company, Atlanta, Ga.
Berger Mfg. Div. Republic Steel Corp., Canton, O.
• Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized)
California Wire Cloth Corp., Oakland, Calif.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Coppered)
• Columbia Steel Co., San Francisco.
Continental Steel Corp., Kokomo, Ind. (Plain galvanized steel)
Copperweld Steel Co., Glassport, Pa.
Downs-Smith Brass & Copper Co., Inc., New York City.
• Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh. (Galvanized)
Laclede Steel Co., St. Louis.
Page Steel & Wire Div., Monessen, Pa.
• Republic Steel Corp., Cleveland. (Steel)
Roebling's Sons Co., John A., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, O. (Bronze, Aluminum)
• Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wickwire Spencer Steel Co., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRING MACHINES

See Machines, Wiring

WRENCHES (SOCKET, OPEN END)

Fairmont Tool & Forging Co., Cleveland.
Snap-On Tools Corporation, Kenosha, Wis. (Boxocket)

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Section of

American Artisan

1946 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 2—TRADE NAMES]

A

AAF—Air Filters. American Air Filter Co., Inc., Louisville, Ky.

ABC—Blower-Washer units. American Blower Corp., Detroit.

ABC—Air Conditioning Furnaces, Water Heaters, Oil Burners. Automatic Burner Corp., Chicago, Ill.

ABC—Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.

ACB—Metal Protecting Paint. Tropical Paint & Oil Co., Cleveland.

A/C—Washable Filters. American Air Filter Co., Inc., Louisville, Ky.

AM—Solder. Alpha Metals, Inc., Brooklyn.

AMS—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

A-P Dependable — Controls. Automatic Products Company, Milwaukee.

A-P — Heat Regulators, Thermostats, Solenoids. Automatic Products Co., Milwaukee, Wis.

A.R.A. — Asbestos Return Air Sheets. Grant Wilson, Inc., Chicago.

ASBO — Ventilators. American Steel Band Co., Pittsburgh.

ate—Timing Systems. Automatic Temperature Control Co., Inc., Philadelphia.

"A. W."—Plates and Sheets. Alan Wood Steel Co., Conshohocken, Pa.

Abrasoweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Acco-Lastic—Caulking Compounds. Accurate Metal Weather Strip Co., New York, N. Y.

Ace—Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.

Ace—Damper Regulators. Martens & Stormoen, Boston.

Acid-Proof—Insulating Cement. Quigley Company, New York City.

Acidseal—Paints and Coatings. B. F. Goodrich Co., Akron, O.

Acolite (Bakelite)—Enamels. Acorn Refining Co., Cleveland, O.

Ad-Mix — Waterproofing Compounds. Eastern States Supply Co., Brooklyn, N. Y.

Aeratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Aetiv-Air—Air Conditioning Furnaces. Heil Co., Milwaukee, Wis.

Aetiv-Flame — Oil Burners. Heil Co., Milwaukee, Wis.

Adacast—Refractories. Botfield Refractories Co., Philadelphia.

Adamant—Insulating Cement. Botfield Refractories Co., Philadelphia.

Adapatch — Refractories. Botfield Refractories Company, Philadelphia, Pa.

Ada-Stic—Insulating Cement. Botfield Refractories Co., Philadelphia, Pa.

Aeracool—Fan Blades, Fans, Louvres and Shutters, Ventilators. Myers Electric Co., Pittsburgh, Pa.

Aerisweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Aer-Nu—Odor Adsorbers. E. A. Lundy Co., New York, N. Y.

Aerocrat—Blowers, Louvres, Washers. W. R. Ames Co., San Francisco, Cal.

Aerofuse — Air Diffusers. Tuttle & Bailey, Inc., New Britain, Conn.

Aerolux—A. C. Furnaces. S. T. Johnson Co., Oakland, Cal.

Aeropel—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.

Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.

Aeroplex—Blowers. Bayley Blower Co., Milwaukee, Wis.

Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.

Aeropull—Ventilators. Paul R. Jordan & Co., Inc., Indianapolis, Ind.

Aerovalve—Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J.

Aero-Way—Furnaces. Harvey Whipple, Inc., Springfield, Mass.

Afco — Blowers, Blower-Filters, Furnaces and Stokers. American Furnace Co., St. Louis, Mo.

Afco "Duo Blo"—Furnaces. American Furnace Co., St. Louis, Mo.

Afco Master-Gas—Furnaces. American Furnace Co., St. Louis, Mo.

Affco — Grilles, Louvres. American Foundry & Furnace Co., Bloomington, Ill.

Agile—Welding Electrodes. American Agile Corp., Cleveland.

Agitair—Air Diffusers, Baffles, Filters, Water Heaters, Vanes, Ventilators. Air Devices Inc., New York City.

Airacoustic — Insulation. Johns-Manville, New York City.

Airate—Ventilators. Aeolus Dickinson, Chicago.

Airboy—Blower Filter. The Peerless Electric Co., Warren, Ohio.

Aircell — Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.

Air-Champ—Evaporative Coolers, Attic Fans, Air Washers. Alton Manufacturing Co., Dallas, Tex.

Airco — Electrodes, Soldering Flux Welding Rod, Torches and Welding Equipment. Air Reduction Sales Co., New York City.

Air-Con—Heating & Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Air Control—Air Conditioning Units, Bearings, Blowers, Blower-Filters, Blower Housings and Wheels. Hastings Air Conditioning Co., Inc., Hastings, Nebr.

Aircor—Wire Cloth Filters. Air Filter Corporation, Milwaukee.

Aire-Flo — Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Air-Flo—Dampers and Louvers. Air Conditioning Products Co., Detroit.

Air Flow — Blowers, Fans, Blower Wheels. Goettl Bros., Phoenix, Ariz.

Aire-RAY-ator — Furnaces. Ray Oil Burner Co., San Francisco.

Airex—Air Conditioning Units, Blowers Fans, Washers. Mountain States Equipment Co., Denver, Colo.

Air-Fan—Window Ventilators. Reliable Sheet Metal Engineering Co., Chicago.

Airflo—Pipe, Fittings and Accessories. Milcor Steel Co., Milwaukee.

Airflo — Furnaces. Aladdin Heating Corp., Oakland, Cal.

Airfoil—Fans and Fan Blades, Ventilators. Aero Fan Co., Piqua, O.

Airguide—Hygrometers and Thermometers. Fee & Stemwedel, Inc., Chicago, Ill.

Air Horse—Pneumatic Hammer, Grinder, Rotary File, Ideal Commutator Dresser Co., Sycamore, Ill.

Airidge — Ridge Ventilators. Aeolus Dickinson, Chicago.

Airkem—Air Freshening Compound. W. H. Wheeler, Inc., New York City.

Airistocrat — Fan Blades. Torrington Mfg. Co., Torrington, Conn.

Airjector—Ventilators. Swartwout Co., Cleveland.

Airkem — Air Freshening Compounds. W. H. Wheeler, Inc., New York.

Air Kooler—Evaporative Conditioners. Utility Appliance Corporation, Los Angeles.

Air Lader—Louvers and Shutters. Edwin F. Guth Co., St. Louis.

Air-Lift — Blowers and Fans. Mauer Engineering, Evanston, Ill.

Airline—Furnaces. Joliet Heating Corp., Joliet, Ill.

Airline—Registers & Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Airline — Ventilators. Danzer Metal Works Co., Hagerstown, Md.

Airlok—Mineral Wool. Plastergon Wall Board Co., Buffalo.

Air-Marvel—Fans. General Blower Co., Philadelphia, Pa.

Airmat—Filters, American Air Filter Co., Inc., Louisville, Ky.

Airmover—Blowers. Skuttle Mfg. Co., Detroit.

Airmover — Ventilators. Swartwout Company, Cleveland, O.

Air-O-Matic — Air Conditioning Units. Williams Oil-O-Matic Htg. Corp., Bloomington, Ill.

Airo-Flex—Directional Flow Registers. Auer Register Co., Cleveland.

Airotor — Blower Wheels. Torrington Mfg. Co., Torrington, Conn.

Air-Pak—Blower-Filter Units. Air Controls, Inc., Cleveland.

Airpyrator — Blowers. Burnwell Corp., Allentown, Pa.

Air-Seel—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

Airstat—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.

Airstream — Blower Wheels. Morrison Products, Inc., Cleveland.

Airstream—Filters. A. G. Brauer Supply Co., St. Louis.

Airtopia — Air Conditioning Units. Drayer-Hanson, Inc., Los Angeles.

Airtrol—Blower-Filters, Attic Fans. Air Control Products, Inc., Coopersville, Mich.

Air-Turn—Vanes. Barber-Colman Co., Rockford, Ill.

Air-Van — Roof Ventilators. Gallaher Co., Owatonna, Minn.

Air-Vane—Registers. Rock Island Register Co., Rock Island, Ill.

Airvule—Concrete Waterproofing Paint. Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.

Air Wave — Ventilating Fans. Trade-Wind Motorfans, Inc., Los Angeles.

Airway—Louvers and Ventilators. Firecraft Corporation, Chicago.

Air-X-Hauster—Ventilators. G. C. Breidert Co., Los Angeles.

Ajax — Prefabricated Ducts, Fittings, Metal Shingles, Skylights. Cincinnati Sheet Metal & Roofing Co., Cincinnati.

Akron Air Blast—Furnaces. May-Fiebeger Co., Newark, Ohio.

Albron — Aluminum Paint. Aluminum Company of America, Pittsburgh.

Alclad—Sheets. Aluminum Company of America, Pittsburgh.

Alco—Ventilators. A. H. Lumm Co., Toledo, Ohio.

Alcoa—Aluminum Products. Aluminum Co. of America, Pittsburgh, Pa.

Alkaclite — Paint. Protective Coatings, Incorporated, Detroit.

All-Alloy — Shears. Bremil Mfg. Co., Erie, Pa.

Allen-Flux—Soldering Flux. L. B. Allen Co., Inc., Chicago.

Allkote — Paint. Acme Refining Co., Cleveland.

All-Sol—Flux. L. B. Allen Co., Chicago.

Alltite — Insulation. Coast Insulating Corp., Los Angeles.

All-Weather — Roof Cement, Caulking and Waterproofing Compounds, Roofing Paint. Ford Roofing Products Company, Chicago.

Alma — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Almar—Hand Slitting Machines. Ward Machinery Co., Chicago, Ill.

Almetal—Fire Doors. Merchant & Evans Co., Philadelphia, Pa.

Almor—Thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Alodine — Aluminum surface treatment. American Chemical Paint Co., Ambler, Pa.

Alumaweld—Flux and Solder. Lloyd S. Jonnson Co., Chicago.

Alumbrite — Paint. Thompson & Co., Pittsburgh, Pa.

Alumi-Flux—Soldering Flux. L. B. Allen Co., Chicago, Ill.

Aluminized—Clad Sheets. American Rolling Mill Co., Middletown, Ohio.

Alumin-nu — Metal Cleaner. NuSteel Company, Chicago.

Alumi-Soder—Aluminum Solder. L. B Allen Co., Chicago.

Aluminweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Always Reliable — Soldering Furnaces, Mallets, Torches. Otto Bernz Co., Rochester, N. Y.

Amazon — Water Heaters. Mustee Heater Co., Cleveland.

Ameo—Flux. American Solder & Flux Co., Philadelphia, Pa.

Amerform—Combustion Chambers, Refractories. Commonwealth Products Co., Philadelphia.

American—Crimping, Beading and Cutting Machines. Chas. E. Kraus Mfg. Co., Louisville, Ky.

Amerock — Cabinet and Casing Hardware. American Cabinet Hardware Corp., Rockford, Ill.

Aminco—Anemometers. American Instrument Co., Silver Spring, Md.

Ampac—Welders. Allis-Chalmers Mfg. Co., Milwaukee.

Am-Pe-Co—Blowers. American Machine Products Co., Marshalltown, Ia.

Amplifire—Gas Burner. Surface Combustion, Toledo, Ohio.

Anaconda—Copper and Brass Products. American Brass Co., Waterbury, Conn.

Anchor — Evaporative Coolers, Furnaces. W. H. Stewart Company, Oklahoma City.

Anchor — Hangers. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Anchor Brand—Rivets. Townsend Co., New Brighton, Pa.

Anchor Brand—Soldering Flux. Garden City Laboratory, Inc., Chicago.

Anchor-Kolstoker — Stoker-fired Furnaces and Stokers. Anchor Stove & Range Co., New Albany, Ind.

Anchortite — Nails. Dickson Weatherproof Nail Co., Evanston, Ill.

Anderson—Spray Nozzles. B. F. Sturtevant Co., Hyde Park, Mass.

Anti-Pluvius — Skylights. Hirschman-Pohl Co., Inc., LeRoy, N. Y.

Anti-Spatter — Welding Compound. Wolfe-Kote Co., Sheboygan, Wis.

Antoxide—Metal Protecting Paint. duPont de Nemours & Company, Wilmington, Del.

Apartvent—Window Ventilating Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.

Apex—Furnaces. Excelsior Steel Furnace Co., Chicago.

Apex—Furnaces & Heaters. Dallman Supply Co., Sacramento, Cal.

Apex—Quadrants. Ohio Products Co., Cleveland, O.

Apex—Hangers, Elbows and Fittings. Royal-Apex Mfg. Co., Brooklyn.

Apex Exi-Air—Furnaces. Excelsior Steel Furnace Co., Chicago.

Apexior—Paint. Dampney Co. of America, Hyde Park, Boston, Mass.

Apolloy — Copper Steel. Apollo Steel Company, Apollo, Pa.

Appton Super — Pneumatic Hammer. Brown-Appton Company, New York City.

Aqua Bar—Roof Cement. Continental Products Co., Euclid, O.

Aquadam—Roof Cement, Waterproofing. Blue Ridge Talc Co., Inc., Henry, Va.

Aqua-Flo—Pumps. The Heil Co., Milwaukee.

Aqua-Master—Water Heaters. Century Eng. Corp., Cedar Rapids, Ia.

Aquanil—Waterproofing Compound and Paint. Protective Coatings, Incorporated, Detroit.

Aquard — Waterproofing Compound. Eastern States Supply Co., Brooklyn, N. Y.

Aqua-Scale—Automatic Humidifier. J. P. Glasby Mfg. Co., Belleville, N. J.

Aquatherm—Water Heaters. H. C. Little Burner Co., Inc., San Rafael, Calif.

Aqulux—Water Heaters. S. T. Johnson Co., Oakland, Cal.

Arc-Eng — Air Conditioning Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

ArcoFlame — Oil Burners. American Rad. & Standard Sanitary Corp., Pittsburgh, Pa.

Arctic—Air Conditioning Units. Premier Furnace Co., Dowagiac, Mich.

Arctic Aire—Kitchen Exhaust Fans. F. A. Smith Mfg. Co., Rochester, N. Y.

Arctic Circle — Evaporative Coolers. Goettl Bros., Phoenix, Ariz.

Arex-Austor—Ventilators. Arex Company, Chicago.

Arin Accelerant—Louvers and Shutters. Arex Co., Chicago.

Arin Stationary—Louvers and Shutters. Arex Co., Chicago.

Armco—Plates, Sheets. American Rolling Mill Co., Middletown, O.

Armco Ingot Iron—Roofing and Sheets. American Rolling Mill Co., Middletown, O.

Arm-Glaze—Glazing Compounds. Armstrong Co., Detroit.

Armorize—Paint. Carter Paint Co., Liberty, Ind.

Armstrong—Compressors. General Machinery Co., Spokane, Wash.

Arrow Gas—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Arrowtrol — Heating and Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Arteraft—Blowers and Furnaces. Chicago Steel Furnace Co., Chicago, Ill.

Artisan—Flux. American Solder & Flux Co., Philadelphia, Pa.

Asbestocel—Furnace Insulation. Johns-Manville, New York City.

Asbestocite—Duct Board. Johns-Manville, New York City.

ASBO — Ventilators. American Steel Band Co., Pittsburgh.

Asco—Relays, Switches, Valves. Automatic Switch Co., New York, N. Y.

At-A-Glance — Oil Gauge. Krueger Sentry Gauge Company, Green Bay, Wis.

Ath-A-Nor — Furnaces. May-Fiebeger Co., Newark, Ohio.

Atomist—Humidifiers. American Foundry & Furnace Co., Bloomington, Ill.

Atticvane—Attic Fans. B. F. Sturtevant Co., Boston.

Auto—Humidifier Valves. Maid-O'-Mist, Inc., Chicago.

Autocrat—Fan Blades. Torrington Mfg. Co., Torrington, Conn.

Autocrat—Oil Burners. Chandler Company, Cedar Rapids, Iowa.

Autofire—Stokers. National Stoker Co., Inc., St. Louis.

Automatic—Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Aviation—Snips. Penn Tool Co., Philadelphia.

Axifio — Fans. B. F. Sturtevant Co., Boston.

Axiom—Filters. Blockson & Company, Michigan City, Ind.

B

BB—Blast Gates, Roof Clips, Damper Clips and Tips, Conductor Fittings and Accessories, Snow Guards. Berger Brothers Company, Philadelphia.

B & B — Louvers & Shutters, Blower Wheels. Bishop & Babcock Mfg. Co., Cleveland.

BCA—Ball Bearings. Bearing Co. of America, Lancaster, Pa.

B E — Blowers, Blower-Filters, Fans. Barrett Engineers, Cleveland Heights, Ohio.

B. F. C.—Gas Burners. Moncrief Furnace & Mfg. Co., Dallas, Tex.

B-H—Insulating Cement. Baldwin-Hill Co., Trenton, N. J.

B-H Weatherseal—Waterproofing Compound. Baldwin-Hill Co., Trenton, N. J.

B & W—Refractories & Stokers. Babcock & Wilcox Co., New York City.

Baco — Refractories. Bird Archer Co., Philadelphia.

Badger—Time Switches. Reliance Automatic Lighting Co., Racine, Wis.

Baers—Enamels, Lacquers and Paint. Baer Brothers, New York City.

Baffle Mix—Refractories. Walsh Refractories Corp., St. Louis.

Balloffet—Nozzles. Delavan Engineering Co., Des Moines, Ia.

Balsam - Wool — Flexible Insulation. Wood Conversion Co., St. Paul.

Bankheat—Oil Burners. S. T. Johnson Co., Oakland, Cal.

Bantam — Motors. Small Motors, Inc., Chicago.

Bantam Bully—Air Hammer. Superior Manufacturing Co., Cleveland.

Bar-Brook—Fans, Evaporative Coolers, Ventilators. Shreveport Eng. Co., Inc., Shreveport, La.

Bardamp — Waterproofing Compounds. Acorn Refining Company, Cleveland.

Barlastic—Caulking Compounds. Barland Weatherstrip Material Co., Cleveland.

Bar-Ox—Rust Inhibitor. Truscon Laboratories, Detroit.

Barreled Sunlight—Paint and Enamel. U. S. Gutta Percha Paint Co., Providence, R. I.

Bar-Rust — Metal Protecting Paint. Midland Paint & Varnish Co., Cleveland.

Barry—Pillow Blocks, Pulleys. R. & J. Dick Co., Inc., Passaic, N. J.

Barthel — Soldering Furnaces and Torches. J. A. Sanders, Fulton, N. Y.

Basmor — Air Conditioning Furnace. Bastian - Morley Co., Inc., LaPorte, Ind.

Bear Cat—Booster Fans. Midwestern Supply Co., Bloomington, Ill.

Beaver—Furnaces and Heaters. Danville Stove & Mfg. Co., Danville, Pa.

Beckett Commodore — Oil Burners. R. W. Beckett Eng. Co., Elyria, O.

Beehive—Roofing. Samuel Cabot. Inc., Boston, Mass.

Beloit—Machines, Punches, Tools. Hendley & Whittemore Co., Beloit, Wis.

Bemis — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Benda-Vane — Registers. Rock Island Register Co., Rock Island, Ill.

Bend - Ezy — Grilles and Registers. Standard Stamping & Perforating Co., Chicago.

Berloy — Building Products. Berger Mfg. Co., Div. Republic Steel Corp., Canton, O.

Best—Cast Iron Chimney Caps. Sterling Foundry Co., Sterling, Ill.

Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.

Bethlehem Doe—Oil Burners. Bethlehem Fdy. & Mach. Co., Bethlehem, Pa.

Bettendorf—Oil Burners. Lennox Furnace Co., Marshalltown, Iowa.

Big Sioux—Furnaces. Iowa Foundry Co., Sioux City, Iowa.

Bildrite—Sheathing. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis.

Biltwel—Furnaces. Fraser & Johnston Co., San Francisco.

BI-MIX—Gas Burners. John Zink Co., Tulsa, Okla.

Bitumastic No. 50 — Compounds and Paint. Wailes Dove-Hermiston Corp., Westfield, N. J.

Bitumastic Black Solution — Paint. Wailes Dove-Hermiston Corp., Westfield, N. J.

Bitumastic 70 B — Enamel. Wailes Dove-Hermiston Corporation, Westfield, N. J.

Bituseal—Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Black Diamond—Built-up Roofing. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Black Diamond — Furnaces, Heaters. Maple City Furnace Co., Monmouth, Ill.

Black Diamond—Stokers. Beckley Perforating Co., Garwood, N. J.

Blase Pruf Silver-Lume—Paint. Wilbur & Williams Co., Boston.

Bio-Aire—Blower-Filter Units. Meyer Furnace Co., Peoria, Ill.

Bio-Fan—Kitchen Exhaust Fans. Pryne & Co., Los Angeles.

Blowertrol — Thermostatic Hydraulic Control. White Mfg. Co., St. Paul.

Blowette — Blower-Filter Units. Lau Blower Co., Dayton, Ohio.

Bluebird—Snips. Bergman Tool Mfg. Co., Buffalo.

Blue Flame—Rotary Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

Blue Knight—Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.

Blue - Point — Drills, Tools. Snap - on Tools Corp., Kenosha, Wis.

Blue Ridge—Wire Glass. Libbey-Owens-Ford Glass Co., Toledo, Ohio.

BNCO — Metal Windows, Doors, Skylights, Welding and Sheet Metal Work. Biersach & Neidermeyer Co., Milwaukee, Wis.

Bonderizing—Metal processes. Parker Rust-Proof Co., Detroit.

Boomer—Furnaces, Heaters. Hess-Snyder Co., Massilon, O.

Boost-Aire—Fans. L. J. Mueller Furnace Co., Milwaukee.

Booster—Coils. Aerofin Corporation, Syracuse, N. Y.

Bower—Bearings. Ahlberg Bearing Co., Chicago.

Bradford — Water Heaters. Pennsylvania Range Boiler Co., Philadelphia.

Branford—Oil Burners. Malleable Iron Fittings Co., Branford, Conn.

Brazarc—Electrodes. Universal Power Corporation, Cleveland.

Brazo—Bronze Soldering Flux. Linde Air Products Co., New York City.

Brees-Air — Fans. Buffalo Forge Co., Buffalo, N. Y.

Breese Hydroxilating—Oil Burners. Oil Devices, Chicago.

Breeze—Kitchen Exhaust Fans. Buffalo Forge Co., Buffalo, N. Y.

Brevokrak—Crackle Finish Paint. Zapon Div., Atlas Powder Co., North Chicago, Ill.

Brilliant Fire — Floor Furnaces and Heaters. Ohio Foundry and Mfg. Co., Steubenville, O.

Brillion—Furnaces, Heaters. Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.

Bronsend — Electrodes. Arcos Corp., Philadelphia.

Brookcell — Metal Ceilings. Brooklyn Metal Ceiling Co., Brooklyn, N. Y.

Brownskin—Waterproof Sheathing Paper. Angier Corp., Framingham, Mass.

Budget — Water Heaters. American Radiator & Standard Sanitary Corp., Pittsburgh.

Bull Dog—Snips and Shears. Wiss & Sons Co., Newark, N. J.

Bumble Bee—Welder. Wilson Welder & Metals Co., Inc., New York City.

Bung-Lo—Warm Air Furnaces. Geo. J. Cocking, Santa Ana, Cal.

Bunker Hill—Roofing, Sheets and Solder. Northwest Lead Co., Seattle, Wash.

Bu-Pre-Fire—Furnaces, Heaters. Tennessee Enamel Mfg. Co., Nashville, Tenn.

Burks—Super Turbine Pumps. Decatur Pump Co., Decatur, Ill.

Burner-Set—Castable Refractory. Plibrico Jointless Firebrick Co., Chicago.

Burnham—Pumps. Union Steam Pump Co., Battle Creek, Mich.

Butler—Furnaces. Ramey Mfg. Co., Columbus, O.

Butler—Stokers. Whiting Stoker Sales Co., Chicago.

But-N-tite — Steel Roofing. St. Paul Corrugating Co., St. Paul.

Buzzer — Gas Soldering Furnaces. Charles A. Hones, Inc., Baldwin, N. Y.

C

CDC — Bearings, Couplings, Pulleys. Chicago Die Casting Company, Chicago.

C-H — Relays, Switches and Valves. Cutler - Hammer, Inc., Milwaukee, Wis.

C. H. F. S. Co. — Fittings & Accessories. Chicago Heights Furnace Supply Co., Chicago Heights, Ill.

CID—Pumps. Goulds Pumps, Inc., Seneca Falls, N. Y.

C & L — Soldering Furnaces and Torches. Clayton & Lambert Mfg. Co., Dearborn, Mich.

C J B—Bearings. Ahlberg Bearing Co., Chicago.

CMC Metallic Coating — Aluminum Paint. Acorn Refining Co., Cleveland.

C.M.W.—Stokers. Catskill Metal Works, Catskill, N. Y.

C.M.W. Hot Water Maker—Stoker-Fired Water Heater. Catskill Metal Works, Inc., Catskill, N. Y.

CP—Electric Tools. Chicago Pneumatic Tool Co., New York City.

C-10—High Temperature Paint. Laclede-Christy Clay Products Co., St. Louis.

Calktite — Caulking Compounds, U. S. Stoneware Co., Akron, Ohio.

Caloric — Furnaces. Marshall Furnace Co., Marshall, Mich.

Calwico—Machinery Guards and Wire Cloth. California Wire Cloth Corp., Oakland, Cal.

Camel — Valves. C. L. Bryant Corp., Cleveland, O.

Cam-Stat — Thermostats. Paul Henry Co., Los Angeles.

Cantilever — Hygrometers. Standard Thermometer, Inc., Boston.

Capillary—Air Conditioning Units, Filters, Washers. Air & Refrigeration Corp., New York City.

Capital—Furnaces. Farris Furnace Co., Springfield, Ill.

Capitol Rock Wool—Insulation. Standard Lime & Stone Co., Baltimore.

Capitolaire — Furnaces. United States Radiator Corp., Detroit.

Carbonaire — Oil Burners. Aldrich Co., Wyoming, Ill.

Carburetor-Stoker—Industrial Stokers. Wooley Eng. Co., Detroit.

Cardolite—Caulking Compound. Irvington Varnish & Insulator Co., Irvington, N. J.

Carend—Electrodes. Arcos Corp., Philadelphia.

Careycel—Insulation. Philip Carey Co., Lockland, Ohio.

Careyclad — Metal Protecting Paint. Philip Carey Mfg. Co., Lockland, O.

Careyduct — Prefabricated Ducts and Fittings. Philip Carey Co., Lockland, Ohio.

Carter—Oil Burners. General Oil Heating Corp., West New York, N. J.

Carton Economy — Furnaces. International Heater Co., Utica, N. Y.

Castalu—Blower Wheels and Fans. Advance Aluminum Castings Corp., Chicago, Ill.

Castirnare—Electrodes. Universal Power Corp., Cleveland.

Cast-Refract — Baffles. Quigley Company, Inc., New York City.

Caulk-N-Seal — Caulking Compound. Blue Ridge Talc Co., Inc., Henry, Va.

Caulk-O-Seal — Caulking and Glazing Compounds. Calbar Paint & Varnish Co., Philadelphia, Pa.

Cauxeal — Compounds. X-Pando Corporation, Long Island City, N. Y.

Ce-Co—Caulking Compounds and Paints. Cheesman - Elliot Company, Inc., Brooklyn.

Cecotite — Roofing Paint. Cheesman-Elliot Company, Inc., Brooklyn.

Cello-Sponge—Evaporators. Viking Air Conditioning Corp., Cleveland.

Cell-U-Blanket — Insulation. Masonite Corp., Chicago.

Cellufoam—Duct Insulation. Masonite Corporation, Chicago.

Cementico — Concrete Waterproofing Paint. United States Gypsum Co., Chicago.

Cementseal—Enamels & Paint. Acorn Refining Co., Cleveland.

Cementite—Paint. Thompson & Co., Pittsburgh, Pa.

Cementkote—Paint. Tropical Paint & Oil Co., Cleveland, O.

Cemesto—Duct Boards. Celotex Corporation, Chicago.

Centerflo — Industrial Fans. Holden-Soules, Inc., Detroit.

Centripeller — Ventilating Fans. Paul R. Jordan & Co., Inc., Indianapolis.

Certified—Conditioning Units, Furnaces, Heaters. Stainless & Steel Products Co., Certified Furnace Co. Div., St. Paul, Minn.

Challenger — Domestic Stokers. Link Belt Co., Chicago.

Challenger — Circulating Gas Heaters. Independence Stove & Furnace Co., Independence, Mo.

Challenger—Stokers. Kol-Master Corp., Oregon, Ill.

Chamberlin — Automatic Humidifier. Chandler Co., Cedar Rapids, Ia.

Champion — Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.

Checker Coat — Sheets. Continental Steel Corp., Kokomo, Ind.

Chernack — Retractable Duct. Wiremold Company, Hartford, Conn.

Chicago—Brakes and Presses. Dreis & Krump Mfg. Co., Chicago, Ill.

Chicago-Stokers. Eddy Stoker Corporation, Chicago.

Chicago-Wrigley—Toggle and Anchor bolts. Chicago Expansion Bolt Co., Chicago.

Chicastic Castable—Refractory. Chicago Fire Brick Co., Chicago, Ill.

Chico Brikset — High Temperature Cement. Chicago Fire Brick Co., Chicago, Ill.

Chief—Furnaces. Joliet Heating Corp., Joliet, Ill.

Chieftain — Refrigerating Compressors. Tecumseh Products Co., Tecumseh, Mich.

Chinook—Heating Coils. Bayley Blower Co., Milwaukee, Wis.

Chinookfin — Heating Coils. Bayley Blower Co., Milwaukee, Wis.

Chlorend — Electrodes. Arcos Corp., Philadelphia.

Chromang—Electrodes. Arcos Corporation, Philadelphia.

Chromend—Electrodes. Arcos Corporation, Philadelphia.

Chromeweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Chromium 173 Silver—Aluminum Paint. C. H. Dragert Company, Inc., Brooklyn.

Chromlead — Enamels and Lacquers. Dragert Co., C. H., Inc., Brooklyn.

Chromtrim — Light Weight Shapes, Mouldings, Trim. R. D. Werner Co., Inc., New York City.

Chronat—Furnace and Boiler Repairs. National Fdry. & Furnace Co., Dayton, O.

Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Chrysler-Airtemp — Heating and Cooling Equipment. Airtemp Div., Chrysler Corp., Dayton, Ohio.

Cibulas—Puttyless Skylights. General Sheet Metal Works, Inc., Bridgeport, Conn.

Cinch—Expansion Bolts. National Lead Co., New York City.

Cinkote—Paint. Blue Ridge Talc Co., Inc., Henry, Va.

Circle T—Switches. Trumbull Electric Mfg. Co., Plainville, Conn.

Circo—Louvers & Shutters. Circulators & Devices Mfg. Corp., New York City.

CirCOOLator — Fans and Ventilators. Viking Air Conditioning Corporation, Cleveland, O.

Circulaire—Heaters. J. V. Patten Co., Sycamore, Ill.

Circu-Ray—Furnaces and Heaters. Tennessee Enamel Mfg. Co., Nashville, Tenn.

Clason—Snow Guards. M. N. Cartier & Sons Company, Providence, R. I.

Class 60—Fuel Oil Pumps. Kraissl Company, Inc., Hackensack, N. J.

Classic—Heating & Ventilating Registers. Auer Register Co., Cleveland, O.

Clean-Aire—A. C. Furnaces. Harvey-Whipple, Inc., Springfield, Mass.

Cleanaire — Blower-Filters. Peerless Foundry Co., Indianapolis, Ind.

Cleco — Pneumatic Tools. Cleveland Pneumatic Tool Co., Cleveland.

Cleveland — Furnaces. Dornback Furnace & Fdy. Co., Cleveland.

Climate - Changer — Air Conditioning Units. Trane Co., La Crosse, Wis.

Climate Master—Oil Burning Air Conditioning Furnace. Hess Warming & Ventilating Co., Chicago, Ill.

Climatrol—Blower-Filter Units. Furnaces. L. J. Mueller Furnace Co., Milwaukee.

Clincher—Conductor Fittings and Accessories. Milcor Steel Co., Milwaukee.

Clipper—Kitchen Exhaust Fans. Trade-Wind Motorfans, Inc., Los Angeles.

Colalloy—Light Weight Shapes, Plates. Technical Processes Div., Colonial Alloys Co., Philadelphia.

Colawelding — Flux. Technical Processes Div., Colonial Alloys Co., Philadelphia.

Colbrazing—Flux. Technical Processes Div., Colonial Alloys Co., Philadelphia.

Coldstream — Air Conditioning Units. Baker Ice Machine Company, Inc., Omaha, Nebr.

Cole — Draft Governor. Cole-Sullivan Engineering Co., Minneapolis.

Collopakes — Roofing Paint. Samuel Cabot, Inc., Boston.

Colonial — Blower-Filters, Oil Burners, Furnaces, Humidifiers, Heaters, Stokers. Green Colonial Furnace Co., Des Moines, Ia.

Colonial — Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn.

Colortipt—Arc Welding Electrodes. Wilson Welder & Metals Co., Inc., New York City.

Columbia—Ventilators. E. E. Souther Iron Co., St. Louis.

Columbus—Humidifiers. Fred D. Pfening Co., Columbus, Ohio.

Columbus—Ventilators. F. O. Schoedinger, Columbus, O.

Combustioneer — Stokers. Steel Products Engineering Co., Springfield, O.

Comet—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.

Comet Exhaustair—Fans and Ventilators. New York Blower Co., Chicago, Ill.

Comfort — Furnaces. May - Fiebeger Company, Newark, Ohio.

Comfort Air — Humidifiers. Comfort Products Corporation, Harvey, Ill.

Comfortaire — Furnaces. Hammel Radiator Engineering Co., Los Angeles.

Comfortmaker—Furnaces. Joliet Heating Corp., Joliet, Ill.

Comfortrol—Blowers and Blower Units, Furnaces. Waterman-Waterbury Co., Minneapolis.

Comfortzone — Oil-fired Water Heater. Michigan Tank & Furnace Corp., Detroit.

Commander—Furnaces. Peerless Foundry Co., Indianapolis, Ind.

Co-Min-Co—Insulating Cement. United States Mineral Wool Co., Chicago.

Compact—Blowers. Bishop & Babcock Mfg. Co., Cleveland, O.

Compact — Oil Burners. The Aldrich Co., Wyoming, Ill.

Compactaire — Air Conditioning Furnaces. Glasby Mfg. Co., Inc., J. P., Belleville, N. J.

Condor—Belts. Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.

Coni-Vane — Ventilators. Allen Corp., Detroit.

Conservoil—Oil Burners. Crane Company, Chicago.

Consisto-Weld — Welding Compound. Turco Products, Inc., Los Angeles.

Consolaire—Circulating Heaters. Hammel Radiator Eng. Co., Los Angeles.

Conterflow—Air Conditioning Furnaces Western Blower Co., Seattle.

Con-Tek — Waterproofing Compounds. Eastern States Supply Co., Brooklyn, N. Y.

Control-O-Gas—Valves. Payne Furnace Co., Beverly Hills, Calif.

Controlaire—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

Convector — Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago.

Convert—Gas Burners. Columbia Burner Company, Toledo, Ohio.

Coolair—Fans and Ventilators. American Coolair Corp., Jacksonville, Fla.

Coolero — Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Coolite—Heat Absorbing Glass. Mississippi Glass Company, New York City.

Copperior — Sheets. Superior Sheet Steel Co., Canton, O.

Copperskin—Waterproof sheathing paper. Angier Corp., Framingham, Mass.

Cop-R-Loy — Copper Bearing Steel Sheets. Wheeling Steel Corp., Wheeling, W. Va.

Copruf—Roofing. Copper Roofs Corporation, Milwaukee.

Copruf Valley — Flashings. Copper Roofs Corporation, Milwaukee.

Co-Res-Co — Coatings, Caulking Compounds, Lacquers, Metal Protecting Paint. Cordo Chemical Corp., Norwalk, Conn.

Corinco — Insulation. Cork Insulation Co., Inc., New York, N. Y.

Corkboard—Insulation. Armstrong Cork Co., Lancaster, Pa.

Corona—Dust Separator and Collector. Clark Dust Control Company, Chicago.

Corozone — Ozone Apparatus. Coroaire Heater Corp., Cleveland.

Cottrell — Dust Collectors. Research Corporation, New York City.

Cottrell Process — Collectors. Western Precipitation Corp., Los Angeles.

Crane Basmor — Bastian-Morley Co., Inc., LaPorte, Ind.

Crescent — Furnaces. Green Colonial Furnace Co., Des Moines, Ia.

Crescent—Oil Burners. Caloroil Burner Corp., Hartford, Conn.

Crescent — Furnaces. Crane Company, Chicago.

Crescent—Skylights, Ventilators. American Sheet Metal Works, New Orleans, La.

Crest—Water Heaters. Day & Night Mfg. Co., Monrovia, Calif.

Crestoloy — Tools. Crescent Tool Co., Jamestown, N. Y.

Cromaloy — Stainless Soldering Flux. Linde Air Products Co., New York City.

Crucibleweld—Arc Welding Electrodes. Westinghouse Electric & Mfg. Co., East Pittsburgh.

Crusader — Oil Burners. Bethlehem Fdry. & Mach. Co., Bethlehem, Pa.

Crystal—Crackle Finish Paint. Hilo Varnish Corp., Brooklyn.

Custom-Aire — Furnaces and Heaters. Heating Equipment Co., San Francisco.

Cuttend — Electrodes. Arcos Corp., Philadelphia.

Cyclops—Bearings. Roller Bearing Co. of America, Trenton, N. J.

D

D&E—Vacuum Furnace Cleaners, Stokers. Dickson Coal Co., New York City.

D-Q—Furnace Vacuum Cleaners. Densmore-Quinlan Co., Kenosha, Wis.

Dakota—Oil Burners. Fargo Foundry Co., Fargo, N. D.

Dampertrol—Controls. Hotstream Heater Co., Cleveland.

Dana—Fans, Fume Exhausters, Louvres, Ventilators. Geo. B. Klee Co., Cincinnati.

Da-Nite — Acratherm. Minneapolis-Honeywell Reg. Co., Minneapolis.

Daptobin—Gas Burners. Beck Engineering Combustion Kompany, St. Louis.

Dasco—Punches, Tools. Damascus Steel Products Corporation, Rockford, Ill.

Dayton Thorobred — V-Belts. Dayton Rubber Mfg. Co., Dayton, Ohio.

Day-Steel — Pulleys. Dayton Rubber Mfg. Co., Dayton, Ohio.

Deco—Metal Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati.

Decoseal—Paints. Debevoise Co., Brooklyn.

Defender—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

Deflecto — Ventilators. The Day Co., Minneapolis, Minn.

Deflectrol—Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.

Degraco — Enamels. Lacquers and Paints. Detroit Graphite Co., Detroit.

Dehydrantine — Waterproofing. A. C. Horn Co., Long Island City.

Delon — Time Switches. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Delco-Heat — Oil Burners, Furnaces, Motors, Pumps and Stokers. Delco Appliance Div., General Motors Corp., Rochester, N. Y.

DeLuxe — Air Conditioning Furnaces. Williamson Heater Co., Cincinnati.

DeLuxe—Gravity Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

DeLuxe — Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Deoxidine — Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.

Dependable—Paint. Heath & Milligan Mfg. Co., Chicago, Ill.

Dereka—Paint. Debevoise Co., Brooklyn, N. Y.

De-Sta-Co — Blower Housings and Stampings. Detroit Stamping Co., Detroit.

Detroit LoStoker — Stokers. Detroit Stoker Co., Detroit.

Detroit RotoStoker—Overfeed Spreader Stoker. Detroit Stoker Co., Detroit.

Detroit UniStoker — Stokers. Detroit Stoker Co., Detroit.

Dexter Heat Valve—Ridge Ventilators Swartwout Co., Cleveland.

Dexter-Tubular — Locks and Latches. National Brass Co., Grand Rapids, Mich.

Dial—Damper Regulator. Martens & Stormoen, Boston.

Dial-Set — Stokers. Kol-Master Corp., Oregon, Ill.

Diamond — Compounds, Enamels, Lacquers and Paint. Thompson & Co., Pittsburgh, Pa.

Diamond—Smoke Pipe Dampers. Adams Company, The, Dubuque, Ia.

Diamond H — Controls, Relays, Switches. Hart Mfg. Co., Hartford, Conn.

Di-Arco — Precision Machines. O'Neil-Irwin Mfg. Co., Minneapolis.

Dickinson—Ventilators. Aeolus Dickinson, Chicago, Ill.

Dickrope—V-type Belts. R. & J. Dick Co., Passaic, N. J.

Dike—Furnace Cement. George B. Klee Co., Cincinnati, O.

Di-Mol—Saws. Henry Disston & Sons, Inc., Philadelphia.

Directaire—Air Conditioning Furnaces. Fitzgibbons Boiler Co., Inc., New York City.

Dixigas—Gas Welding Rod. Atlantic Steel Co., Atlanta, Ga.

DixiPeer—Electrodes. Atlantic Steel Co., Atlanta, Ga.

Dixisteel—Angles, Bars, Channels, Rivets, Wire. Atlantic Steel Co., Atlanta, Ga.

Do-All — Combination Hammer and Drill. Wodack Electric Tool Corp., Chicago.

Dorex—Odor Adsorbers. W. B. Connor Eng. Corp., New York City.

Dorwil—Utility Room Furnaces. Gibraltar Engineering Co., Los Angeles.

Double Diamond — Humidistats, Psychrometers, Relays, Switches, Thermometers. H-B Instrument Company, Philadelphia, Pa.

Double-Duty—Oil Burners. Aldrich Co., Wyoming, Ill.

Double-Lock — Roofing. Copper Roofs Corporation, Milwaukee.

Double-Seal—Humidifier Fittings. Hays Mfg. Co., Erie, Pa.

Dover-Imperial—Eaves Trough Hangers. Ohio Wire Products Co., Dover, Ohio.

DovRioy—Sheets. Reeves Steel & Mfg. Co., Dover, Ohio.

Dowmetal — Plates and Sheets. Dow Chemical Company, Midland, Mich.

Draft-A-Juster—Barometric Dampers. Preferred Utilities Mfg. Corp., New York City.

Draft KoreKtor—Damper. Cole-Sullivan Engineering Co., Minneapolis.

Draftmaster — Barometric Draft Controls. Piatt Products Corp., Lansing, Mich.

Draftender — Motors and Regulators. Penn Electric Switch Co., Goshen, Ind.

Draft-O-Stat — Draft Regulators and Smoke Pipe Dampers. Hotstream Heater Company, Cleveland.

Draftrite—Draft Gages. Bacharach Industrial Instrument Co., Pittsburgh.

Dreadnaught — Soldering Torches and Furnaces. P. Wall Mfg. Supply Co., N. S. Pittsburgh.

Dri-Air—Dehumidifiers. Tamms Silica Company, Chicago.

Drifilter—Filters. American Air Filter Co., Inc., Louisville, Ky.

Dri-Lap—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

Dri-N-Tite—Cement. A. C. Horn Co., Long Island City, N. Y.

Driwal—Waterproofing Compound. The Glidden Co., Cleveland.

Drou-ve-lite — Skylights. Hirschman-Pohl Co., Inc., LeRoy, N. Y.

Duni-Clone—Blow Pipe Collectors. Day Co., Minneapolis.

Dubbiseal — Sheeting. Masonite Corp., Chicago.

Duco—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.

Ducon — Controls, Soldering Coppers. Dual Remote Control Co., Wayne, Mich.

Ductboard — Prefabricated Ducts. Sall Mountain Co., Chicago.

Duct Soundliner — Duct Insulation. Baldwin-Hill Company, Trenton, N. J.

Ducturns—Vanes. Tuttle & Bailey, Inc., New Britain, Conn.

Ductype — Blowers. South Bend Air Products, Inc., South Bend, Ind.

Dukrome—Metal Protecting Paint. du-Pont de Nemours & Co., Wilmington, Del.

Dul-Kote—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Dulux—Enamels, Lacquers and Paints. E. I. du Pont de Nemours & Co., Wilmington, Del.

Duo-Lock—Pittsburgh Lock Formers. Riverside Machinery Co., Chicago.

Duplate—Safety Glass. Pittsburgh Plate Glass Co., Pittsburgh.

Duplex—Flashings. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Dura—Furnaces, Heaters. Barry Furnace Co., Hamilton, O.

Dur-A-Ble—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

DuraBilt — Gravity Registers. Auer Register Co., Cleveland, Ohio.

Duraclad—Water Heaters. A. O. Smith Corporation, Milwaukee.

Dura-Flex — Directional Flow Registers. Auer Register Co., Cleveland.

Dura-Line—Heating & Ventilating Registers. Auer Register Co., Cleveland.

Dura-Sheen — Flues and Roof Jacks. Baltimore Enamel and Novelty Co., Baltimore.

Dura-Steel—Registers. Middleton Mfg. & Sales Co., Minneapolis.

Duratite—Glazing Compounds. Tropical Paint & Oil Co., Cleveland.

Durex—Bearings. General Motors Corp., Moraine Products Div., Dayton, Ohio.

Durimet—Acid Resisting Sheets. Duriron Co., Dayton, O.

Duronze—Plates and Sheets. Bridgeport Brass Co., Bridgeport, Conn.

Duroplastic—Caulking & Glazing Compounds. Acorn Refining Co., Cleveland.

DustStop — Filters. Owens-Corning Fiberglas Corp., Toledo, Ohio.

Dust-Trap — Filters. Morf Industries, Staten Island, N. Y.

Dustube—Cloth Bag Type Dust Collecters. American Foundry Equipment Co., Mishawaka, Ind.

Dutch Boy—Paint and Solder. National Lead Co., New York City.

Dux-Sulation — Duct Insulation. Grant Wilson, Inc., Chicago, Ill.

Dye-Crete—Concrete Paint. Wilbur & Williams Co., Boston.

Dynaflow—Blowers and Fans. South Bend Air Products, Inc., South Bend, Ind.

Dynetric — Balancing Equipment. Gisholt Machine Co., Madison, Wis.

E

EM—Motors. Electric Machinery Mfg. Co., Minneapolis.

E-Z Arc—Arc Welders. Will-Weld Mfg. Co., Omaha, Nebr.

Eagle Deluxe—Motors. Small Motors, Inc., Chicago, Ill.

Eagle Mineral Wool—Insulation. Eagle-Picher Co., Cincinnati, O.

Eagle Star — Solder. Eagle-Picher Co., Cincinnati.

Eagle Super—Insulating Cement and Flashing. Eagle-Picher Co., Cincinnati, O.

Eagle Super "66"—Furnace Insulation. Eagle-Picher Co., Cincinnati, O.

Eagle Supertemp — Duct Insulation. Eagle-Picher Co., Cincinnati, O.

Eagle Tin-Loy — Tinning Compounds. Eagle-Picher Co., Cincinnati, O.

Earle — Ventilators. Berger Bros. Co., Philadelphia, Pa.

Easternoil—Oil Burners. Eastern Oil & Equipment Co., Portland, Me.

Easy—Buffers, Grinders, Polishers and Sanders. Detroit Surfacing Machine Co., Detroit.

Easy Bead—Eaves Trough and Gutters. St. Paul Corrugating Co., St. Paul, Minn.

Easy-Flo—Solder. Handy & Harman, New York, N. Y.

Easy-Slip — Conductor Pipe, Eaves Trough and Gutters. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.

Easyweld—Electrodes. Universal Power Corporation, Cleveland, O.

E. C. Cord—V-Belts. Goodyear Tire & and Rubber Co., Inc., Akron, O.

Echo—Ceiling Ventilators. Elgo Shutter & Mfg. Co., Detroit, Mich.

Econocol—Stokers. Cotta Transmission Corporation, Rockford, Ill.

Economizer — Nozzles. Bahnson Co., Winston-Salem, N. C.

Economy — Power Hack Saws. F. L. Robertson, Buffalo, N. Y.

Economy—Furnaces, Heaters. International Heater Co., Utica, N. Y.

Economy — Adjustable Buffing Hoods. Kirk & Blum Mfg. Co., Cincinnati, O.

Economy—Ventilators. Arex Company, Chicago, Ill.

Economy — Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Econo-Therm — Registers, Middleton Mfg. & Sales Co., Minneapolis, Minn.

Edge Seal—Filters. Wilson & Co., Inc., Chicago, Ill.

Efico — Louvres, Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Efico Louver—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

80—FWA—Utility Room Furnace. Fitzgibbons Boiler Co., Inc., New York, N. Y.

Elasticon—Roofing Paint. A. C. Horn Co., Long Island City, L. I., N. Y.

Elastikote—Paint, Tropical Paint & Oil Co., Cleveland, O.

El-Bow — Roof Ventilators. Trade-Wind Motorfans, Inc., Los Angeles.

El Dryol — Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

Electric City—Gutter Forming Machines. F. L. Robertson, Buffalo, N. Y.

Electric Filter Watchman—Air Filter Gauge. Herbusch Corp., St. Louis, Mo.

Electric Furnace—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Electric Furnace Man—Domestic Stoker. General Machine Co., Inc., Emmaus, Pa.

Electric Janitor—Controls and Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Electric Piston — Damper Motors and Draft Regulators. Hotstream Heater Co., Cleveland.

Electro-Airmat—Filters. American Air Filter Co., Inc., Louisville, Ky.

Electro-Cell — Filters. American Air Filter Co., Inc., Louisville, Ky.

Electrolaire — Air Conditioning Furnaces. Electrol Mfg. Co., Passaic, N. J.

Electro-Matic — Filters. American Air Filter Co., Inc., Louisville, Ky.

Electro-Mist—Oil Mist and Smoke Collector. American Air Filter Co., Inc., Louisville, Ky.

Electronic Tornado—Arc Welders. Lincoln Electric Co., Cleveland, O.

Electropump—Water Circulating Pump. Weil Pump Company, Chicago, Ill.

Electro-Sheet—Roofing. American Brass Co., Waterbury, Conn.

Electro Way—Fans. Ward Mfg. Co., Plymouth, Mich.

Electro-Wind—Ventilators. Allen Corp., Detroit, Mich.

Elgin — Pneumatic Hammers, Brazing Torches and Welders. Borm Mfg. Co., Elgin, Ill.

Elgin — Louvers and Shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.

El Glykol—Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

Elite—Gravity Registers. Auer Register Co., Cleveland, O.

Elsco — Motors. Electric Sprayit Co., Sheboygan, Wis.

Emerson, Jr.—Emerson Electric Mfg. Co., St. Louis, Mo.

Empire—Mallets. Greene, Tweed & Co., Bronx, N. Y.

Enamel-Kote — Enamels. Acme White Lead & Color Works, Detroit, Mich.

Endurance—Cement and Paint. Glidden Company, Cleveland, O.

Enduro—Sheets. Republic Steel Corp., Cleveland, O.

Epco—Perforated Metals. Erdle Perforating Co., Rochester, N. Y.

EPCO — Welding Timer. Electronic Products Co., Geneva, Ill.

Era—Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.

Era Exl-Air—Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.

Esco—Smoke Pipe Dampers. Eselgroth & Co., Newark, N. J.

Esico — Electric Soldering Coppers. Electric Soldering Iron Co., Inc., Deep River, Conn.

Essco — Solder, Paint, Roofer Tools. Eastern States Supply Co., Brooklyn, N. Y.

Esso—Furnaces, Oil Burners. Gilbert & Barker Mfg. Co., West Springfield, Mass.

Eternium—Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Eureka—Furnaces. Home Stove Co., Indianapolis, Ind.

EuteChromes—Electrodes and Welding Rod. Eutectic Welding Alloys Co., New York.

Eutector — Flux. Eutectic Welding Alloys Co., New York City.

EuteeRods — Welding Rods. Eutectic Welding Alloys Co., New York City.

EuteeTrodes — Electrodes. Eutectic Welding Alloys Co., New York City.

Evanair—Furnaces and Gas Heaters. Evanoil Div., Evans Products Co., Detroit, Mich.

Evco—Valves. Electric Valve Mfg. Co., New York, N. Y.

Evenheet — Damper Motors. Sampsell Time Control, Inc., Spring Valley, Ill.

Everdur — Plates, Sheets, Electrodes, Welding Rod. American Brass Co., Waterbury, Conn.

Everjet—Roofing Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Everwear—Eaves Trough and Gutters with Fittings, Ridge Rolls and Ridging, Roofing, Metal Shingles and Tile. Southern States Iron Roofing Co., Savannah, Ga.

Exidust—Dust Collectors. Allen Billmyre Co., Mamaroneck, N. Y.

Ex-L-Ite—Sheets. Republic Steel Corporation, Cleveland, O.

E-Z-On—Damper Clips and Tips, and Damper Regulators. M. A. Gerett Co., Milwaukee, Wis.

Ezy-Flo — Torch Formula Soldering Paste. L. B. Allen Co., Inc., Chicago, Ill.

F

F & D—Refractories. General Insulating Products Co., Brooklyn, N. Y.

F & E—Underfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

F.M.D.—Solder. American Smelting & Refining Co., New York, N. Y.

Fabrikated — Faces, Grilles, Registers. Independent Register Co., Cleveland, O.

Faceweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Fairweather — Blower-Washer Units Furbio Company, Hermansville, Mich.

Falco—Sheets. Fairmont Aluminum Co., Fairmont, W. Va.

Famous — Furnaces. Excelsior Steel Furnace Co., Chicago.

Famous Exl-Air — Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago, Ill.

Fan-Air—Gas Burners. Lee B. Mettler Co., Los Angeles.

Far-Air—Evaporative Coolers, Filters. Farr Co., Los Angeles, Calif.

Far-Air Rotary — Automatic Filters. Farr Co., Los Angeles, Calif.

Fareo—Soldering Flux. Farrelloy Company, Inc., Philadelphia, Pa.

Fargail—Soldering Flux. Farrelloy Co., Philadelphia.

Far Quar—Furnaces. Farquhar Furnace Co., Wilmington, O.

Farsol—Soldering Flux. Farrelloy Co., Inc., Philadelphia.

Fastemp—Furnaces. Norge Heating & Cond. Div., Detroit, Mich.

Featherfin—Coils. L. J. Wing Mfg. Co., New York, N. Y.

Featherweight—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Federal—Refractories. U. S. Stoneware Co., Akron, O.

F Electric — Fan Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Felt-Cote — Steel Roofing. American Steel Band Co., Pittsburgh, Pa.

Fenestra — Heat Insulating Windows. Detroit Steel Products Co., Detroit, Mich.

Fenn's Rotary—Roof Ventilators. Waverly Heating Supply Co., Boston, Mass.

Ferro—Soldering Flux. Linde Air Products Co., New York.

Ferrobord — Steel Roofing. Truscon Steel Co., Youngstown, O.

Ferrocind — Building Insulation. Truscon Steel Co., Youngstown, O.

Ferrocraft — Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Ferro-Therm—Reflective Insulation. C. T. Hogan & Co., Inc., New York.

Ferroweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Fiberglas—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.

Fiberkote—Roof Cement. National Manufacturing Corp., Tonawanda, N. Y.

Fi-Blak—Insulation. Western Rock Wool Corp., Huntington, Ind.

Fibronized — Plastic Tubing. Irvington Varnish & Insulator Co., Irvington, N. J.

Filporize — Waterproofing Compounds. Eastern States Supply Co., Brooklyn, N. Y.

Filtered Aire—Blower-Filters. American Foundry & Furnace Co., Bloomington, Ill.

Findlay—Stokers. Central Rubber & Steel Corporation, Findlay, Ohio.

Fine Air—Air Conditioning Furnaces. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.

Fin-Flex—Directional Flow Registers. The Auer Register Co., Cleveland, O.

Fin-Line—Directional Flow Registers. The Auer Register Co., Cleveland, O.

Firebox—Combustion Chambers. Sid Harvey, Inc., Valley Stream, N. Y.

Fibercote — Roofing Paint. Midland Paint & Varnish Co., Cleveland.

Firecrete — Refractories. Johns-Manville, New York, N. Y.

Firedaire — Circulating Heaters. Edwards Mfg. Co., Inc., Cincinnati, O.

Fire-Fixer — Firing Tools. Farrell-Cheek Steel Co., Sandusky, O.

Fire-Guard — Stokers. Peerless Mfg. Corp., Louisville, Ky.

Fire-Hearth — Castable Refractories. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Firelite—Cement. Johns-Manville, New York, N. Y.

Fire-King—Stokers. Sinker-Davis Co., Indianapolis, Ind.

Fireline—Furnace Firepot Lining. Fireline Stove & Furnace Lining Co., Chicago.

Firelite—Refractories. Fireline Stove & Furnace Lining Co., Chicago.

Fire Pilot — Stoker Control. Sampsel Time Control, Inc., Spring Valley, Ill.

Fire Tender—Stokers. Holcomb & Hoke Mfg. Co., Indianapolis, Ind.

Firma—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Fitrite—Conductor, Eaves Trough and Gutter Fittings and Accessories, Skylight Lifts, Snow Guards, Ventilators. David Levow, or Rival Strap Corp., New York, N. Y.

Fitzgibbonsaire—Air Conditioning Unit. Fitzgibbons Boiler Co., New York, N. Y.

Fixit — Cement. National Mfg. Corp., Tonawanda, N. Y.

Flame-Otrol — Controls. Wheelco. Instruments Company, Chicago.

Flash-Off No. 99 — Industrial Finish. Acme White Lead & Color Works, Detroit, Mich.

Flash-Rite — Flashings. The Figge Mfg. Co., Chicago, Ill.

Flatjet—Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Flat-Top—Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

Fleetweld — Arc Welding Electrodes Lincoln Electric Co., Cleveland, O.

Fleur de Lis—Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Flexaire—Registers and Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Flexarc—Arc Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Flexibiae"—Paint. Samuel Cabot, Inc., Boston, Mass.

Flexitube—Coils. Aerofin Corporation, Syracuse, N. Y.

Flex-Tube—Draft Gauges. F. W. Dwyer Mfg. Co., Chicago, Ill.

Flo-Co — Furnaces. Floral City Co., Monroe, Mich.

Floxy—Solder. Merchant & Evans Co., Philadelphia, Pa.

Flor-Aire—Floor Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

Flosol—Flux. American Chemical Paint Co., Ambler, Pa.

Flo-Warm—Coal, Oil, Gas and Stoker-Fired Furnaces. Williamson Heater Co., Cincinnati, O.

Flualyzer — Portable Co_2 Analyzer. Chas. Engelhard, Inc., Newark, N. J.

Fluid Heat — Oil Burners, Furnaces, Water Heaters. Anchor Post Fence Co., Baltimore, Md.

Foamglas—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, and Pittsburgh Corning Corporation, Pittsburgh.

Follansbee—Furnace Pipe. Sheet Metal Specialty Co., Pittsburgh, Pa.

Forbes Syphonaire—Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.

Force-Flo—Water Circulating Pumps. Kehm Corp., Chicago.

Ford-V-Neer — Building Insulation. Ford Roofing Products Co., Chicago, Ill.

Forest Fleece—Insulation. John J. Doheny Co., Belmont, Mass.

Forstair—Circulating Heaters. Pernot & Rich, Inc., Los Angeles, Calif.

Fosco—Skylights. F. O. Schoedinger, Columbus, O.

Foundation Coating — Waterproofing. Glidden Co., Cleveland, O.

4-Way-Flow—Registers. U. S. Register Co., Battle Creek, Mich.

Fractional Horsepower—V-Belts. B. F. Goodrich Co., Akron, O.

Fracto-Crete—Castable Refractory. Ramtite Co., Chicago.

Franzite—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Free-Aire—Air Conditioning Units, Furnaces, Circulating Heaters. Kehm Corporation, Chicago.

Freeman—Stokers. Illinois Iron & Bolt Co., Chicago, Ill.

Freeport—Oil Burners. Holtum Mfg. Co., Freeport, Ill.

Fresh-Air Maker — Fans, Ventilators. Schwitzer-Cummins Co., Indianapolis.

Frigid—Night Air Cooling and Exhaust Fans and Fan Blades. Circulators & Devices Mfg. Corp., New York, N. Y.

Front End—Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Fros-T-aire — Air Conditioning Units. Palmers Manufacturing Corp., Phoenix, Ariz.

Frost-O-Lite—Paint. Sanvin Chemical Products Co., Moline, Ill.

Fuel-Door — Gas Burners. Handley Brown Heater Co., Jackson, Mich.

Fuel-Saver—Automatic Draft Regulator. Walker Mfg. & Sales Corp., St. Joseph, Mo.

Fulflo — Fuel Oil Filter. Commercial Filters Corp., Boston.

Fulljet—Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Fulscope—Controls. Taylor Instrument Companies, Rochester, N. Y.

Fulton—Copper Paint. Debevoise Co., Brooklyn, N. Y.

Fulton—Register Shield. Patent Novelty Co., Fulton, Ill.

Fyre-Mortar—Insulating Cement. Quigley Company, Inc., New York, N. Y.

Fyr-Feeder — Stokers. American Coal Burner Company, Chicago, Ill.

Fyrgard—Doors. Richmond Fireproof Door Co., Richmond, Ind.

Fyrite—CO_2 Analizers. Bacharach Industrial Instrument Co., Pittsburgh.

Fyr-Fly—Oil Burners. The Aldrich Co., Wyoming, Ill.

G

G. B. C.—Blowers and Fans. General Blower Co., Philadelphia, Pa.

G/C — Controls. General Controls Co., Glendale, Calif.

G-E—Air Conditioning Units, Oil Burners, Compressors, Controls, Soldering Coppers, Couplings, Electrodes, Fans, Flux, Furnaces, Humidistats, Motors, Relays, Switches, Transformers, Solenoid Valves, Thermostats, Welders. General Electric Co., Bloomfield, N. J., and Schenectady, N. Y.

G-E-Glow — Sterlizing Lamps. General Electric Co., Cleveland.

G-M—Louvres, Shutters, Metal Stampings, Ventilators. Gillian Mfg. Co., Detroit, Mich.

G. R.—Air Conditioning Units. Window Ventilators and Filter Units. General Refrigeration Div. Yates-American Machine Co., Beloit, Wis.

G-R — Welders. Glenn-Roberts Company, Oakland, Calif.

Galbestos—Flashings and Roofing. H. H. Robertson Co., Pittsburgh.

Galvanide—Metal Protecting Paint. A. C. Horn Co., Long Island City, N. Y.

Galvaprep—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.

Galv-O-Zinc — Coating, Paint. Blue Ridge Talc Co., Inc., Henry, Va.

Garland — Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit, Mich.

Gas King—Furnaces. J. King Kent & Co., St. Louis, Mo.

Gas Mixer—Furnaces. Floral City Co., Monroe, Mich.

Gastite—Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

Gasweld—Soldering Coppers, Torches, and Welding Equipment. Wall Chemicals Div., Liquid Carbonic Corp., Chicago.

Gem—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.

Gem—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

Gemaco — Compressors. General Machinery Co., Spokane, Wash.

Gemware — Hygrometers, Psychrometers, Thermometers. G. M. Mfg. Co., New York, N. Y.

Gen-Arc—Arc Welders. General Equipment Co., Wichita, Kan.

General — Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Generator—Coils. Hotstream Heater Co., Cleveland, O.

Germicidal — Sterlizing Lamp. General Electric Co., Cleveland.

Gerotor — Fuel Oil Pump. May Oil Burner Div., Gerotor May Corp., Baltimore.

Giant—Oil Burners. Aldrich Co., Wyoming, Ill.

Giant — Skylight Lifts. Danzer Metal Works Co., Hagerstown, Md.

Giant Red Devil—Pullers. Crescent Tool Co., Jamestown, N. Y.

Gibraltar—Furnace and Heaters. P. H. MaGirl Foundry & Furnace Works, Bloomington, Ill.

Gilbarco—Furnaces, Oil Burners. Gilbert & Barker Mfg. Co., West Springfield, Mass.

Gilco—Furnaces and Water Heaters. J. L. Gillen Co., Dowagiac, Mich.

Gilt Edge—Furnaces. Schwab Furnace Co., Milwaukee, Wis.

Gipsy—Circulating Gas Heaters. Independence Stove & Furnace Co., Independence, Mo.

Gladiator—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Glazola — Glazing Compounds. Nebel Mfg. Co., Cleveland, O.

Globe—Sheets. Newport Rolling Mill Co., Newport, Ky.

Globe—Ventilators. J. M. & L. A. Osborn Co., Cleveland, O.

Globe Sizzler—Hot Water Coils. Globe Machinery & Supply Co., Des Moines, Ia.

Glo-Fyr—Oil Burners. Aldrich Co., Wyoming, Ill.

Glowan—Gas Burners. J. O. & C. U. Martin, San Francisco, Calif.

Gnome—Oil Burners. Aldrich Co., Wyoming, Ill.

Gohi—Eaves Trough & Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

Gohi — Sheets. Newport Rolling Mill Co., Newport, Ky.

Gold Bond—Insulation Board, Tile. National Gypsum Co., Buffalo, N. Y.

Gold Bond-Gimco — Rock Wool Products, Insulating Cement. National Gypsum Co., Buffalo, N. Y.

Gordon—Gas Conversion Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.

Gradutrol — Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Grand Rapids—Vacuum Furnace Cleaner. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.

Graylite — Building and Duct Insulation, Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.

Greastop — Filters. Air-Maze Corporation, Cleveland, O.

Grid—Heating and Cooling Coils. D. J. Murray Mfg. Co., Wausau, Wis.

Grillometer — Direct Reading Air Velocity Meter. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.

Gross-Aire—Furnaces and Stokers. Grossenbacher Furnace Co., St. Louis, Mo.

Guthfan—Ventilating Fans. Edwin F. Guth Company, St. Louis.

H

H-B—Gas Conversion Burner. Handley Brown Heater Co., Jackson, Mich.

H&C—Registers. Hart & Cooley Mfg. Co., Holland, Mich.

H & K—Perforated Metals. Harrington & King Perforating Co., Chicago, Ill.

HairBestos—Insulation. Wilson & Co., Inc., Chicago, Ill.

Haircraft—Insulation. Wilson & Co., Inc., Chicago, Ill.

Hair Glass—Filters. H. J. Somers, Inc., Detroit, Mich.

Hammerkraft—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Hammer-Sets—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.

Handaib—Punches. National Machine Tool Co., Racine, Wis.

Handy—Pipe, Prefabricated Ducts and Fittings. F. Meyer & Bro. Co., Peoria, Ill.

Handy-Andy—Clinker Tong. Northwestern Stove Repair Co., Chicago, Ill.

Handy Change—Arc Welders. Maple Valley Mfg. Co., Mapleton, Iowa.

Handy-Flux—Soldering Flux. Handy & Harman, New York, N. Y.

Happy Thought — Heaters. Pittston Stove Co., Pittston, Pa.

Hardlead — Lead Roofing. National Lead Co., New York.

Hardweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Health-Air — Window Ventilator-Filters. Reliable Sheet Metal Engineering Co., Chicago, Ill.

Health-aire—Blower, Coils, Fans, Louvers and Shutters and Ventilators. Johnson Fan & Blower Corp., Chicago, Ill.

Hearth—Refractories. Refractory & Insulation Corporation, New York, N. Y.

Heat-Aid—Furnace Linings. Pyrolite Products Co., Cleveland, Ohio.

Heatane—Water Heaters. Hoyt Heater Co., Los Angeles.

Heat Booster—Warm Air Booster Fans. Victor Electric Products, Inc., Cincinnati, Ohio.

Heat Breaker — Fans. Warren Earl Company, Houston, Tex.

Heat-Flo—Gas Burners. Bryant Heater Co., Cleveland.

Heat Holder—Baffles. Sid Harvey, Inc., Valley Stream, N. Y.

Heat Hustler—Booster Fans. American Foundry & Furnace Co., Bloomington, Ill.

Heat-O-Meter—Controls. Miller Heat-O-Meter Co., Milwaukee.

Heat-Pak—Oil Burners. Aldrich Co., Wyoming, Ill.

Heat Proof—Paint. Glidden Co., Cleveland, O.

Heat-Rite—Gravity Registers. Auer Register Co., Cleveland, O.

Heatrola—Heaters. Estate Stove Co., Hamilton, O.

Heatseal—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

Heatway — Stoker Furnace. Rheem Manufacturing Co., Stokermatic Div., Salt Lake City.

Heavyduty—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.

Heet-Master — Kettles. Aeroil Burner Co., Inc., West New York, N. J.

Heilite — Refractories. Johns-Manville, New York, N. Y.

Helyx—Drive Screws, Nails. Hillwood Manufacturing Co., Cleveland, O.

Herco — Welders, Transformers. Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.

Hercules—Furnaces. Johnston Gas Furnace Corp., North Hollywood, Calif.

Hercules—Gravity Roof Ventilators. Berger Bros. Co., Philadelphia, Pa.

Heresite—Pipe and Fittings. Heremetal Co., Minneapolis, Minn.

Hermetic—Furnaces. Favorite Mfg. Co., Piqua, Ohio.

Hero—Heaters. J. V. Patten Co., Sycamore, Ill.

Hev-E-Oil — Oil Burners. Sanmyer Corp, Chicago, Ill.

Hevikoat—Electrodes. Universal Power Corporation, Cleveland, Ohio.

Hexagonal Mesh—Wire Glass. Mississippi Glass Co., New York, N. Y.

Hi-Boy — Furnaces. Aladdin Heating Corp., Oakland, Calif.

HiBoy—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Hicycle—Electric Tools. Chicago Pneumatic Tool Co., New York, N. Y.

Hi-Degree Gray Coating—Paint. Cheesman-Elliot Co., Inc., Brooklyn, N. Y.

High Pressure—Coils. Aerofin Corporation, Syracuse, N. Y.

High-Ten- No. 500—Solder. Industrial Service Laboratories, Milwaukee, Wis.

Highway—Copper Iron. Apollo Steel Co., Apollo, Pa.

Hi Heat — Enamels and Lacquers, Aluminum Paint. J. H. Krehbiel Co., Chicago, Ill.

Hi Heat—Gas Burners. Hansen Electric Co., San Francisco.

Hi-Heat Gray—Paint. Wailes Dove-Hermiston Corporation, Westfield, N. J.

Hilo Spatter—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Hilume—Aluminum Paint. Hilo Varnish Corp., Brooklyn, N. Y.

Hinman—Angle Benders. J. K. Supply Co., Sandwich, Ill.

Hi-Speed — Electric Dimpler. York Electric Tool Co., York, Pa.

Hi-Speed—Nibbler and Shears. Libert Machine Co., Green Bay, Wis.

Hi-Spra—Spray Nozzles. Thermal Industries, Indio, Calif.

Hi-Temp—Insulating Cement. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Hi-Test—Safety Glass. Libbey-Owens-Ford Glass Co., Toledo, Ohio.

Hitoneast — Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Hoal — Louvred Ventilators. American Sheet Metal Works, New Orleans, La.

Hoffman—Water Heaters. Clayton & Lambert Mfg. Co., Louisville.

Hold Heat—Soldering Coppers. Turner Brass Works, Sycamore, Ill.

Holgun—Portable Electric Drills. Black & Decker Mfg. Co., Towson, Md.

Holtite — Screws. Continental Screw Co., New Bedford, Mass.

Home — Furnaces. Des Moines Stove Repair Co., Des Moines, Iowa.

Home Comfort—Blowers, Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Hornblende — Metal Protecting Paint. North American Fibre Products Co., Cleveland, Ohio.

Hot Blast—Furnaces and Heaters. Cole Hot Blast Mfg. Co., Chicago, Ill.

Hot Blast — Soldering Furnaces and Torches. Turner Brass Works, Sycamore, Ill.

Hotco—Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.

Hot Spot — Electric Welders. Acme Electric Welder Co., Los Angeles, Calif.

Hot Wave—Coils. Rudy Furnace Co., Dowagiac, Mich.

Howle — Heat Savers. Condensation Engineering Corp., Chicago, Ill.

Huber—Overfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

Humiclean—Cleaning Compound. Carolina Aniline & Extract Co., Charlotte, N. C.

Humidair—Humidifiers. Skilbeck Mfg Co., Kenosha, Wis.

Humidair—Washers. American Foundry & Furnace Co., Bloomington, Ill.

Humidigraph — Hygrometers. Bristol Company, Waterbury, Conn.

Humidiguide—Hygrometer. Taylor Instrument Companies, Rochester, N. Y.

Humidostat — Humidistats. Johnson Service Co., Milwaukee, Wis.

Humiduct—Humidifiers. Bahnson Co. Winston-Salem, N. C.

Humphrey — Furnaces and Heaters. General Gas Light Co., Kalamazoo, Mich.

Hy-Boy—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Hycarb—Electrodes. Universal Power Corporation, Cleveland, O.

Hydramotor — Gas Regulating Valve. General Controls Co., Glendale, Calif.

Hydraulic-Action — Controls. White-Rodgers Electric Co., St. Louis, Mo.

Hydrocide—Compounds, Waterproofing. L. Sonneborn Sons, Inc., New York, N. Y.

Hydro-Clone — Blowpipe Collectors and Fume Exhausters. Whiting Corporation, Harvey, Ill.

Hydronon — Concrete Waterproofing Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Hydro-Whirl—Dust Collectors. Peters-Dalton, Inc., Detroit, Mich.

Hy-Duty—Blades, Fans, Blowers, Housings, Pumps, Ventilators, Wheels. Schwitzer-Cummins Co., Indianapolis, Ind.

Hy-Power—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Hyspar—Roof Cement, Compounds, Paint. Midland Paint & Varnish Co., Cleveland, O.

Hy-Speed—Hydraulic Tools. Reimuller Brothers Company, Franklin Park, Ill.

Hytemp—Insulation. Keasbey & Mattison Company, Ambler, Pa.

Hytempite—Furnace Cement. Quigley Company, Inc., New York, N. Y.

Hytest—Paint. National Mfg. Co., Tonawanda, N. Y.

I

IEC—Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

Ice-O-Matic — Compressors. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Ideal—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.

Ideal — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Ideal—Roofing Nails. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Ideal (Air Cell)—Insulation. Hinde & Dauch Paper Co., Sandusky, Ohio.

Ilgair — Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Ilgette—Kitchen Exhaust Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Illbronze—Aluminum Paste and Powder. Illinois Bronze Powder Co., Inc., Chicago.

Immersatherm — Domestic Hot Water Supply Control. Mercoid Corp., Chicago.

Impact—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York, N. Y.

In-Bilt—Kitchen Exhaust Fans. Victor Electric Products, Inc., Cincinnati, O.

Inco—Paint. Inter-Coastal Paint Co., East St. Louis, Ill.

Inco—Nickel Alloys and Welding Rod, Sheets. International Nickel Co., Inc., New York, N. Y.

Inconel — Alloy Plates, Sheet, Tubing. International Nickel Company, Inc., New York, N. Y.

Independent — Heaters. Independence Stove & Furnace Co., Independence, Mo.

Indian—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

IngAclad—Plates and Sheets. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill.

Ingels — Elbow Machine. Maplewood Machinery Co., Chicago.

Ingot Iron—Sheets, Ridge Rolls and Ridging. American Rolling Mill Co., Middletown, Ohio.

Inkstop—Filters. Air-Maze Corporation, Cleveland, O.

Insa-Lute—Insulating Cement. Sauereisen Cements Co., Pittsburgh, Pa.

Ins-Lite—Building and Duct Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.

Insola—Metal Protecting Paint. Acorn Refining Co., Cleveland, O.

Insulag—Insulation and Insulating Cement. Quigley Co., Inc., New York, N. Y.

Insulate-Windows — Heat Insulating Windows. Chamberlin Company of America, Detroit.

Insulbrick — Insulation. Quigley Co., Inc., New York, N. Y.

Insulcrete — Insulation. Quigley Co., Inc., New York, N. Y.

Insulduct—Prefabricated Ducts. Smith-Raymond Co., Columbus, Ga.

Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.

Insulmat—Insulation. J. W. Mortell Co., Kankakee, Ill.

Interlock—Pipe. Milcor Steel Co., Milwaukee, Wis.

Interlox—Plastic Tee. Extruded Plastics, Inc., Norwalk, Conn.

Inter-Matic—Time Switches. International Register Co., Chicago.

Ionaire—Ozone Apparatus. Electroaire Corp., Chicago.

Ironhide—Paint. Pittsburgh Plate Glass Co., Pittsburgh.

Ironite—Hot Surface Paint. Acorn Refining Co., Cleveland, O.

Iron Lung — Ventilators. Powermatic Ventilator Company, Cleveland.

Ironset — Asbestos Furnace Cement. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Ironside — Paint. Thompson & Co., Pittsburgh, Pa.

Irpo—Rust-Proofing. Wolfe-Kote Co., Sheboygan, Wis.

Isl City—Registers. Rock Island Register Co., Rock Island, Ill.

Isomode — Vibration Controls Mounts. M B Manufacturing Co., Inc., New Haven, Conn.

Ivanhoe—Heaters. Perfection Stove Co., Inc., Cleveland, O.

J

J & C—Blowers, Oil Burners, Furnaces. Jackson & Church Co., Saginaw, Mich.

JFS—Transmissions. Stephen-Adamson Mfg. Co., Aurora, Ill.

J-Line—Deep Well Pumps. J. K. Supply Co., Sandwich, Ill.

J-M—Insulation, Roofing. Johns-Manville, New York, N. Y.

Jack Frost—Insulation. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Janitrol — A. C. Units, Gas Burners, Furnaces. Surface Combustion, Toledo, O.

Jet-Cote—Roof Cement. Acme White Lead & Color Works, Detroit, Mich.

Jet-Lastic—Roof Cement. Acme White Lead & Color Works, Detroit, Mich.

Jet-O-Matic—Water Circulating Pumps. Gould Pumps Inc., Seneca Falls, N. Y.

Jewel — Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit, Mich.

Jiffee — Coils. Hotstream Heater Co., Cleveland, O.

Jiffy — Regulator Set. Parker-Kalon Corp., New York, N. Y.

Jointite—Insulation. Mundet Cork Corporation, Brooklyn.

Julian d'Este — Gas Pressure Valves. Reading-Pratt & Cady Div., American Chain & Cable Co., Reading, Pa.

Jumbo—Oil Burners. The Aldrich Co., Wyoming, Ill.

June-Aire—Furnaces. American Foundry & Furn. Co., Bloomington, Ill.

Juniata—Soldering Flux. Geo. W. Diener Mfg. Co., Chicago, Ill.

Junior—Fans. West Wind Corporation, Seattle.

JusRite—Ducts and Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.

JusRite L-Bo—Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.

K

K-B—Damper Clips, Tips and Regulator Sets. G. L. Kerentoff, Cincinnati, Ohio.

KCB — Sheets. Newport Rolling Mill Co., Newport, Ky.

KCB—Eaves Trough and Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

K&M — Damper Regulator, Valves. Kieley & Mueller, Inc., North Bergen, N. J.

K&M—Insulation. Keasbey & Mattison Co., Ambler, Pa.

K&M Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.

K&M Hy-Temp—Insulation. Keasbey & Mattison Co., Ambler, Pa.

K&M Simplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.

KO—Oil Burning Water Heaters. Automatic Humidifier Co., Cedar Falls, Iowa.

K.S.V.—Ventilators. Kernchen Co., Chicago, Ill.

Kant Krush — Roof Strainers. Grand Rapids Wire Products Co., Grand Rapids, Mich.

Karatex—Insulation. Blocksom & Company, Michigan City, Ind.

Kast-O-Lite—Refractories. A. P. Green Fire Brick Co., Mexico, Mo.

Kathabar—A. C. Units. Surface Combustion, Toledo, O.

Kathode—Electrodes. Lincoln Electric Co., Cleveland, O.

Kaukit—Caulking Compound. L. Sonneborn Sons Inc., New York, N. Y.

Kelsey-Bradley — Furnaces, Kelsey Heating Co., Inc., Syracuse, N. Y.

Kemick — Paint. American Chemical Paint Co., Ambler, Pa.

Ken—Flue Gas Analyzers, Anemometers, Baffles, Combustion Chambers, Controls, Humidifiers, Damper Motors, Thermometers and Valves. Barclay Inc., Robert, Chicago, Ill.

Kent Concrete Coating—Concrete Waterproofing Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Keystone—Heaters. J. V. Patten Co., Sycamore, Ill.

Kimsul — Insulation. Kimberly-Clark Corp., Neenah, Wis.

Kleen-Air—Filters. Kaye & MacDonald, Inc., West Orange, N. J.

Kleenflo—Filters. Air-Maze Corp., Cleveland, O.

Klenk's Aviation—Snips. Reiner & Campbell Co., Inc., Elizabeth, N. J.

Klixon—Controls, Relays, Thermostats. Spencer Thermostat Co., Attleboro, Mass.

Klondike—Welders. Ralph Fern, Scranton, Pa.

Knock-Out—Arc Welders, Buffers, Grinders, Polishers and Sanders. K. O. Lee & Son Co., Aberdeen, S. D.

Kno-Draft — High Velocity Air Diffusers, W. B. Connor Eng. Corp., Dorex Div., New York, N. Y.

Kold-Aire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.

Kolostat — Furnace Draft Regulator. P. C. Timm & Son, Lincoln, Neb.

Kolstoker—Stokers. Anchor Stove & Range Co., New Albany, Ind.

Kooler-Aire — Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.

Koolshade—Sun Reflecting Screens. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

Koolstack—Furnaces. Leader Iron Works, Inc., Decatur, Ill.

Koppax—Paint, Koppers Co., Inc., Pittsburgh, Pa.

Korolax RX—Metal Protective Coatings. B. F. Goodrich Co., Akron, O.

Koroseal—Plastic. B. F. Goodrich Co., Akron, O.

Koroseal Tape RX—Protective Coatings. B. F. Goodrich Co., Akron, O.

Kristokrak — Enamels and Lacquers. Zapon Division Atlas Powder Co., North Chicago, Ill.

Krome-Kote—Welding Compound. Wolfe-Kote Co., Sheboygan, Wis.

Kumfort Cooler—Evaporative Coolers. Utility Appliance Corporation, Los Angeles, Calif.

Kwik-Way — Ladder Brackets. Myers Ladder Equipment Co., Madison, Wis.

L

L. A.—Motors. Louis Allis Co., Milwaukee, Wis.

L-M—Tubing. Lewin-Mathes Co., St. Louis, Mo.

L & N—Instruments. Leeds & Northrup Co., Philadelphia, Pa.

L & R — Conductor Pipe. Lamb & Ritchie Co., Cambridge, Mass.

L-R—Flexible Couplings. Lovejoy Flexible Coupling Co., Chicago, Ill.

L-U—Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Lacq—Lacquers. Glidden Company, Cleveland, O.

Lakeside — Blowers. Furblo Co., Hermansville, Mich.

Lancol—Stainless Steel Soldering Flux. F. H. Langsenkamp Co., Indianapolis, Ind.

Larco—Mineral Paste. Western Mineral Products Co., Omaha, Nebr.

Lastik Wampum—Cement Paint. Lastik Products Co., Inc., Pittsburgh, Pa.

Latest—Skylight Lifts. Danzer Metal Works Co., Hagerstown, Md.

Leader — Oil Burners and Circulating Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.

Lead-Head — Nails. W. H. Maze Co., Peru, Ill.

Lead-Seal—Roofing Nails. The Denison Co., Chicago, Ill.

Lead-Sealed—Sheets. Continental Steel Corp., Kokomo, Ind.

Leastoker—Stokers. H. Leslie Leas Co., Monona, Ia.

Leadtex—Lead-Coated Sheets. Revere Copper and Brass Incorporated, New York, N. Y.

Lectrodryer — Dehumidifier. Pittsburgh Lectrodryer Corp., Pittsburgh.

Lectro-Glo — Heaters. Day & Night Mfg. Co., Monrovia, Calif.

Lectro-Shear—Portable Electric Shears. Black & Decker Mfg. Co., Towson, Md.,

Ledaloyl — Sleeve Bearings. Johnson Bronze Co., New Castle, Pa.

Lehigh—Furnaces, Heaters. Pittston Stove Co., Pittston, Pa.

Leonard—Circulating Oil Heater. W. R. Ames Co., San Francisco, Calif.

LeRoy—Fan and Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Liberty—Water Heaters. Day & Night Mfg. Co., Monrovia, Calif.

Liberty — Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Liberty—Paint. Carter Paint Co., Liberty, Ind.

Liberty—Ventilators. Penn Ventilating Company, Philadelphia, Pa.

Lifetime — Furnaces. Hart & Crouse Corp., Utica, N. Y.

Lightweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Lincoln—Furnaces, Heaters. American Foundry & Furnace Co., Bloomington, Ill.

Lincolntrol — Foot-Operated Welding Control. Lincoln Electric Co., Cleveland.

Lincolnweld — Arc Welders, The Lincoln Electric Co., Cleveland, O.

Linseal — Furnace Cement. Buckeye Products Co., Cincinnati, O.

Linestart—Motors. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Lipman — Coils, Compressors. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

Liquid Elastigum—Paint and Roofing Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Lithoform—Metal Protecting Paint. American Chemical Paint Co., Ambler, Pa.

Little Blacksmith — Punches and Slitting Machines. J. F. Kidder Mfg. Co., Inc., Burlington, Vt.

Little Bobby—Bending Brakes. A. R. Harris, Hammond, Ind.

Little Giant — Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Llenroc — Fire Doors. Cornell Iron Works, Inc., Long Island City, N. Y.

Lloyd's—Stainless Soldering Flux. Lloyd S. Johnson Co., Chicago, Ill.

Lloyd's No. 7 — Silver Solder Flux. Lloyd S. Johnson Co., Chicago, Ill.

Lo-Blast — Gas Conversion Burners. National Gas Burner Div., Mid-Continental Metal Products Co., Chicago.

Lo-Boy—Stokers. Whiting Corp., Harvey, Ill.

Locarb—Electrodes. Universal Power Corporation, Cleveland, O.

Lockaire—Insulation Board. Plastergon Wall Board Co., Buffalo, N. Y.

Lock-Joint—Pipe and Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.

Locktite — Damper Regulators. Ohio Products Co., Cleveland, O.

Lok-Joint — Insulating Lath. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.

LoMaintenance — Electric Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Lornate—Chimney Caps & Tops, Ventilators. Hirschman Pohle Co., Inc., LeRoy, N. Y.

Lo-Temp—Welding Compounds. Lloyd S. Johnson Co., Chicago.

Lowdensite—Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.

Luco—Acid Brushes, Compounds, Flux, Solder. Thos. F. Lukens Metal Co., Philadelphia, Pa.

Lume-Tex—Aluminum Paint. Truscon Laboratories, Detroit.

Luminare—Electrodes. Universal Power Corporation, Cleveland, O.

Lumino—Paint. Koppers Co., Inc., Pittsburgh, Pa.

Luminous Vortex — Oil Burners. Iron Fireman Mfg. Co., Cleveland.

Lumitall — Aluminum Paint. National Mfg. Co., Tonawanda, N. Y.

Lupton—Skylights. Michael Flynn Mfg. Co., Philadelphia.

Lustralumin — Aluminum Paint. Blue Ridge Talc Co., Inc., Henry, Va.

Luxaire—Blower-Filters, Furnaces and Humidifiers, Pipe. The C. A. Olsen Manufacturing Co., Elyria, O.

Lyonore—Sheets. Lyon-Conklin & Co., Inc., Baltimore, Md.

Lyston—Soldering Flux. Farrelloy Co., Inc., Philadelphia.

Lystone — Soldering Flux. Farrelloy Company, Inc., Philadelphia, Pa.

M

M. E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.

M & E—Compressors, Solder. Merchant & Evans Co., Philadelphia, Pa.

M.F.C.—Gas Floor Furnaces. Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.

M-H—Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

M & H—Zinc Sheets. Matthiessen & Hegeler Zinc Co., LaSalle, Ill.

M & M—Humidifiers and Fittings, Nozzles, Switches and Valves. McDonnell & Miller, Chicago, Ill.

M-VB—Fittings, Valves. Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.

M/W—Filters. American Air Filter Co., Inc., Louisville, Ky.

Macheta—Fans and Fan Blades, Ventilators. Aerovent Fan Co., Piqua, O.

Mack—Heaters. J. V. Patten Co., Sycamore, Ill.

Magic Dial—Thermostats. Perfex Corporation, Milwaukee, Wis.

Magic Spray—Oil Burners. Conco Engineering Works, Mendota, Ill.

Magic-Weather — Air Conditioners, Blowers and Air Washers. Ballantyne Co., Omaha, Neb.

Magnalite — Wire Glass. J. Merrill Richards, Boston.

Majestic—Roofing, Skylights, Ventilators. W. A. Fingles, Inc., Baltimore, Md.

Malidrill—Electric Drills. Mall Tool Co., Chicago.

Mammoth—Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.

Manganare — Electrodes. Universal Power Corporation, Cleveland.

Manganend—Electrodes. Arcos Corporation, Philadelphia, Pa.

Manganesed-Phospholene No. 7 — Rust Preventitive. Western Reserve Laboratories, Cleveland.

Manganweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Marietta—Enamels and Lacquers. American-Marietta Co., Chicago, Ill.

Mark Time—Relays, Time Switches. M. H. Rhodes, Inc., Hartford, Conn.

Mariox—Metal Protecting Paints. Marley Chemical Co., Detroit, Mich.

Mars — Furnaces. Pacific Gas Heating Co., San Francisco, Calif.

Marsalis — Air Conditioners, Dust Collectors, Attic Fans, Pumps, Ventilators. American Metal Products Co., Fort Worth, Texas.

Marsh Jacuzzi — Pumps. American-Marsh Pumps, Inc., Grand Rapids, Mich.

Marvel — Punches. Armstrong-Blum Mfg. Co., Chicago, Ill.

Masco — Combustion Chambers. Munn and Steele, Inc., Newark, N. J.

Mascobond—Furnace Cement and Insulation. Munn and Steele, Inc., Newark, N. J.

Mascokast — Refractory. Munn and Steele, Inc., Newark, N. J.

Mascote—Insulating Cement and Duct Insulation. Munn and Steele, Inc., Newark, N. J.

Massachusetts—Blowers, Fans. Bishop & Babcock Mfg. Co., Cleveland, O.

Master—Built-Up Roofing. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Master—Controls, Pulleys, Thermostats White Mfg. Co., St. Paul, Minn.

Master—Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Master—Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Master—Stokers. Muncie Gear Works, Inc., Muncie, Ind.

Master Blowertrol—Thermostatic Hydraulic Control. White Mfg. Co., Minneapolis, Minn.

Masterfil—Insulation. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Master Kraft — Coils, Oil Burners and Heat Savers. Harvey-Whipple, Inc., Springfield, Mass.

Master Line—Soldering Torches. Turner Brass Works, Sycamore, Ill.

Mastr-Lok — Pipe Fittings. Parkersburg Iron & Steel Co., Parkersburg, W. Va.

Max-I-min—Furnaces. The Gehri Co., Tacoma, Wash.

Mayari R — Nickel-Chromium Sheets and Plates. Bethlehem Steel Co., Bethlehem, Pa.

Mayn Air—Stack Head Dampers. Henry Furnace Co., Medina, Ohio.

McKee—Gas Burners. Eclipse Fuel Engineering Co., Rockford, Ill.

Mecco—Doors and Shutters, Skylights, Ventilators. Moeschel-Edwards Co., Inc., Cincinnati, O.

Meco—Gas Welding Rod, Torches. Modern Engineering Co., St. Louis, Mo.

Meco Jiffy—Soldering Torches. Modern Engineering Co., St. Louis, Mo.

Melo-Air — Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Mel-Rock — Fan-Filters, Ventilators and Washers. Mellish & Murray Co., Chicago, Ill.

Metalbestos — Pipe and Fittings. Williams-Wallace Co., San Francisco, Calif.

Metal-Coat—Copper Paint. J. W. Stokes, Jr., Brooklyn, N. Y.

Metalized Primer Spray—Midland Paint & Varnish Co., Cleveland, O.

Metallite — Paint. Glidden Company, Cleveland, O.

Metal-Master—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

Metalmaster—Band Saws. DoAll Co., Minneapolis.

Metalprep — Rust Preventative Chemicals. Neilson Chemical Co., Detroit, Mich.

Metal Zipper—Arc Welders. Mid-States Equipment Co., Chicago.

Metaphram—Draft Regulator. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Meteor—Water Heaters. Hoyt Heater Co., Los Angeles.

Metrotherm — Thermostats. General Controls Co., Glendale, Calif.

Meyco—Furnaces. Meyer Furnace Co., Peoria, Ill.

Micafil — Insulation. Munn and Steel, Inc., Newark, N. J.

Micromax — Hygrometers and Recorders. Leeds & Northrup Co., Philadelphia, Pa.

Microtrol—Damper Motors, Barber-Colman Co., Rockford, Ill.

Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.

Micro-Turret — Punches. Wiedemann Machine Co., Philadelphia, Pa.

Micro-Weld—Spot Welders. Micro Products Co., Chicago, Ill.

Midget—Bending Brake. A. R. Harris, Hammond, Ind.

Midget—Damper Regulators. Ohio Products Co., Cleveland, O.

Midget—Spot Welders. Universal Power Corporation, Cleveland.

Midget—Valves. Maid-O'-Mist, Inc., Chicago, Ill.

Midget Kooler-aire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.

Mighty Midget—Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

Mighty Midget—Furnaces. Floral City Company, Monroe, Mich.

Mighty Midget Unishear—Shears. Stanley Works, New Britain, Conn.

Mildaire—Furnaces. Parker Heating & Mfg. Co., St. Petersburg, Fla.

Milwaukee — Water Heaters. A. O. Smith Corporation, Milwaukee.

Mineral Wool Board—Insulation. Armstrong Cork Company, Lancaster, Pa.

Minnemeyer — Conductor Hooks. La Crosse Steel Roofing & Corrugating Co., LaCrosse, Wis.

Minute—Damper Regulator Sets. Joal Mfg. Corp., Toledo, O.

Miracle-Air—Window Ventilators. Reliable Sheet Metal Engineering Co., Chicago, Ill.

Mirro-Matic—Water Heaters. Handley Brown Heater Co., Jackson, Mich.

Mirro-Shell—Water Heaters. Handley Brown Heater Co., Jackson, Mich.

Misco—Wire Glass. Mississippi Glass Company, New York, N. Y.

Missing Link—Arc Welder Attachment. Mid-States Equipment Co., Chicago.

Missouri Flint — Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Mistoil—Oil Burners. Wayne Oil Burner Corp., Fort Wayne, Ind.

Mixend—Electrodes. Arcos Corp., Philadelphia, Pa.

Model—Furnaces, Heaters. Home Stove Co., Indianapolis, Ind.

Modernair—Blower-Filter Units. Payne Furnace Co., Beverly Hills, Calif.

ModernAire — Furnaces, Humidifiers. Des Moines Stove Repair Co., Des Moines, Ia.

Modernaire—Air Conditioning Units, Fans. Dallas Eng. Co., Inc., Dallas, Tex.

Modern Console—Heaters. Payne Furnace Co., Inc., Beverly Hills, Calif.

Moderne-Aire — Furnaces, Blowers. Agricola Furnace Co., Gadsden, Ala.

Moderne—Blowers, Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Modernistic—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Moduflow — Sectional Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.

Modutrol — Damper Duct Motors and Fan Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Mogul — Rust Preventive Chemicals. North American Fibre Products Co., Cleveland, O.

Moldit—Refractories. Refractory & Insulation Corp., New York, N. Y.

Moler—Insulation. F. L. Smidth & Co., New York, N. Y.

Monarch—Furnaces. Forest City Foundries Co., Cleveland, O.

Monerief — Furnaces. Henry Furnace Company, Medina, O.

Monel—Sheets, Plate and Tubing. International Nickel Co., Inc., New York, N. Y.

Monitor—Furnaces. Marshall Furnace Co., Marshall, Mich.

Monmouth—Humidifiers. Cleveland Humidifier Co., Cleveland.

Monogram — Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

Mono-Line—Duct Insulation. Quigley Company, Inc., New York, N. Y.

Monovent — Ridge Ventilators. Burt Mfg. Co., Akron, O.

Monsoon—Louvers and Shutters. Jamieson Mfg. Co., Dallas, Tex.

Morco — Insulated Roof Jacks. Midland Refractories Corp., Chicago.

Morflex — Flexible Couplings. Morse Chain Co., Ithaca, N. Y.

Mor-Mac—Furnaces. Morrison Steel Products, Inc., Buffalo, N. Y.

Morning Air—Furnaces. Jackson Sheet Metal Wks., Ogden, Utah.

Mor-Sun—Furnaces. Morrison Steel Products, Inc., Buffalo.

Mortex—Metal Protective Coatings. J. W. Mortell Co., Kankakee, Ill.

Mortite — Caulking and Glazing Compounds, Roofing Paint. J. W. Mortell Co., Kankakee, Ill.

Moto-Heat—Oil Burners. Brigham Oil Burner Co., St. Louis, Mo.

Motopump—Water Circulating Pumps. Yeomans Bros. Co., Chicago, Ill.

Motorelay — Contact Device. Barber-Colman Co., Rockford, Ill.

Motorpump — Water Circulating Pump. Ingersoll-Rand Co., New York.

Motorized Draft-O-Stat—Controls. Hotstream Heater Co., Cleveland.

Motorstoker—Stokers. Hershey Machine & Foundry Co., Manheim, Pa.

Mototurb—Ventilators. Uno Ventilator Co., Cliftondale, Mass.

Moyno—Pumps. Robbins & Myers, Inc., Springfield, O.

Mule-Hide — Cement, Caulking Compounds, Paint and Roofing. Lehon Company, Chicago, Ill.

Multiblade—Welding Fume Exhausters. General Blower Co., Morton Grove, Ill.

Multiclone—Collectors. Western Precipitation Corp., Los Angeles, Calif.

Multi-Duty—Filters. American Air Filter Co., Inc., Louisville, Ky.

Multiple Star — System of Welding. Electric Arc., Inc., Newark, N. J.

Multi-Speed—Thermostatic Blower Control. National Thermal Drive Co., Inc., St. Paul, Minn.

Multitherm — Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.

Multi-V — Belts. B. F. Goodrich Co., Akron, O.

Multivane—Blowers. B. F. Sturtevant Co., Hyde Park, Boston, Mass.

Multi-Zone—Conditioners. Micheli Air Conditioning Co., Inc., Schenectady, N. Y.

Murex—Arc Welding Electrodes. Metal & Thermit Corp., New York, N. Y.

N

Nairoil—Oil Burners. National Airoil Burner Co., Philadelphia, Pa.

National—Blowers, Furnaces. P. H. Mag-Girl Foundry & Furnace Wks., Bloomington, Ill.

National—Furnaces, Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.

National—Horizontal Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.

National — Water Heaters. Mustee Heater Co., Cleveland.

National-Champion—Furnaces. National Heater Co., Minneapolis.

Natroco — Paint. National Mfg. Corp., Tonawanda, N. Y.

Natur-Temp—Flame-proof Cotton Insulation. Plastergon Wall Board Co., Buffalo.

Naturzone—Board Insulation. Wilson & Co., Inc., Chicago, Ill.

Nebelastic—Roof Cement, Nebel Manufacturing Co., Cleveland.

Nebel-Kote—Paint. Nebel Manufacturing Co., Cleveland.

Nelson — Stokers. Heating Assurance, Spokane, Wash.

Nemo—Insulating Cement. Smith & Kanzler Corp., Elizabeth, N. J.

Nesbit—Furnaces. Standard Furnace & Supply Co., Omaha, Nebr.

Never Slip — Conductor Fittings. La-crosse Steel Roofing & Corrugating Co., LaCrosse, Wis.

New American—Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.

New Departure—Oil Burners. Aldrich Company, Wyoming, Ill.

New Detroit—Draft Gages. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.

Newmanco—Kalamein Doors, Grilles. Newman Brothers, Inc., Cincinnati, O.

Newton — Mallets. Warren Handle Works Co., Cortland, Ohio.

Niagara—Furnaces. Forest City Foundries Co., Cleveland, O.

Nibco—Copper Tube Fittings. Northern Indiana Brass Co., Elkhart, Ind.

Nicklechromeweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Nickelend — Electrodes. Arcos Corp., Philadelphia, Pa.

Nickeloid—Sheets. American Nickeloid Co., Peru, Ill.

997 (Low Fuming) — Welding Rod. American Brass Co., Waterbury, Conn.

9000-Arc—Torch. Mid-States Equipment Co., Chicago.

Nitenir—Night Air Cooling Fans. Lau Blower Co., Dayton, Ohio.

Nitrol—Spray Nozzles. Hubbard Company, Minneapolis, Minn.

NoDrip—Insulation. J. W. Mortell Co., Kankakee, Ill.

Noel—Arc Welders. The Ideal Electric & Mfg. Co., Mansfield, O.

No-Flex—Registers and Faces. Hart & Cooley Mfg. Co., Holland, Mich.

Nokorode—Flux. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Non-Clogging — Spray Nozzles. Link Belt, Co., Chicago, Ill.

Non-Con-Dux — Cement, Insulation. Paper, Paste. Grant Wilson, Inc., Chicago, Ill.

Non-Metallic — Registers. Standard Stamping & Perforating Co., Chicago, Ill.

Nonoize—Booster Fans and Blowers. American Foundry & Furnace Co., Bloomington, Ill.

Non-Spark—Mallets. New Plastic Corporation, Hollywood, Calif.

Non-Syphoning—Steel Roofing. Milcor Steel Co., Milwaukee, Wis.

Norblo—Blowers, Fittings, Collectors, Housings, Air Washers. Northern Blower Co., Cleveland, O.

Norco—Products. Northwestern Stove Repair Co., Chicago, Ill.

Norfolk—Furnaces, Heaters, Humidifiers. Sioux City Foundry and Boiler Co., Sioux City, Ia.

No-Rivet — Damper Regulators. Ohio Products Co., Cleveland, O.

Northland—Heaters. J. V. Patten Co., Sycamore, Ill.

Nor'wester — Blowers. Grand Rapids, Die & Tool Co., Grand Rapids, Mich.

No-Sag—Register Shields. Pentecost & Craft Co., Terre Haute, Ind.

No-Spat—Weld Spatter Protector. Midland Paint & Varnish Co., Cleveland, Ohio.

No-Streak—Registers. Rock Island Register Co., Rock Island, Ill.

"No Tar In"—Roofing Paint. Rutland Fire Clay Co., Rutland, Vt.

No. 2000 — Insulating Cement. J. H. Krehbiel Co., Chicago, Ill.

Novoid—Bases, Insulation. Cork Import Corp., New York, N. Y.

Nu-Air—Blades, Fans, Louvres, Ventilators. Meier Electric & Machine Co., Indianapolis, Ind.

Nu-Alpina—Gravity Roof Ventilators. Milcor Steel Co., Milwaukee, Wis.

Nubrite—Aluminum Paint. Acorn Refining Co., Cleveland, O.

Nu-Grip—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

Nu-Notch—Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J

Nupla Plastic — Mallets. New Plastic Corporation, Hollywood, Cal.

Nuroof—Roof Cement. Acorn Refining Co., Cleveland, O.

Nuvent—Ventilators. Aeolus Dickinson, Chicago, Ill.

Nusurface — Hot Surface Paint. Acorn Refining Co., Cleveland, O.

Nutipe—Gas Conversion Burners. Columbia Burner Company, Toledo, O.

Nu-Way—Sheet Metal Products. Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.

Nu-Wood — Rigid Insulation. Wood Conversion Co., St. Paul, Minn.

O

OK—Conductor Pipe Strainers. U. S. Cistern Filter Mfg. Co., Bloomington, Ill.

O. P.—Stokers and Stoker-fired Furnaces. Pocahontas Fuel Company Incorporated, Cleveland, O.

Octopus, Jr.—Welding Fume Exhauster. Chelsea Fan & Blower Co., Inc., Irvington, N. J.

Ohio Triple Twisted—Wire Hangers. Ohio Wire Products Co., Dover, Ohio.

Oil-Aire-Flo — Furnaces. Lennox Furnace Co., Marshalltown, Iowa.

Oil Chief—Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

Oil-Economy — Oil-Burning Air-Conditioning Furnace. International Heater Co., Utica, N. Y.

Oil-Aire—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Oilfire Monogram — Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

Oilfyre—Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Oilifter — Fuel oil Pump. Automatic Products Co., Milwaukee.

Oil Mizer—Furnaces. Floral City Company, Monroe, Mich.

Oil-n-Aire—Oil Burners. Aldrich Co., Wyoming, Ill.

Oil-O-Matic — Oil Burners, Furnaces. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Old American—Paint, Roofing, Waterproofing. American Asphalt Roof Corp., Kansas City, Mo.

Olympic—Furnaces, Heaters. Washington Stove Works, Everett, Wash.

Olympic Bronze — Electrodes. Plates, Sheets. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Out-O-Wall — Registers. Rock Island Register Co., Rock Island, Ill.

Ovaltube — Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Oxweld—Welding Apparatus. Linde Air Products Co., New York, N. Y.

Oxite — Insulation. American Hair & Felt Co.. Chicago, Ill.

Oxo-Ray—Air Purification. A & J Co., Chicago.

P

PBA Unit — Utility Room Furnace. Dowagiac Steel Furnace Co., Dowagiac, Mich.

P-K—Punches, Screws. Parker-Kalon Corporation, New York, N. Y.

P & H—Arc Welding Electrodes. Harnischfeger Corporation, Milwaukee, Wis.

P & H Hansen — Arc Welders. Harnischfeger Corp., Milwaukee, Wis.

P.I.V.—Gear. Link Belt Co., Chicago.

P & R—Air Conditioning Units, Furnaces and Pumps. Pernot & Rich, Inc., Los Angeles, Calif.

Pacifelt—Insulation. Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.

Pacific—Furnaces. W. W. Rosebaugh Co., Salem, Ore.

Pacific—Blowers, Fans, Furnaces, Heaters. Naco Manufacturing Co., Huntington Park, Calif.

Pacific Hydraulic — Presses and Dies. Equipment Sales Co., Oakland, Calif.

Packaged Weather — Store Coolers. General Electric Co., Bloomfield, N. J.

Paintgrip — Sheets. American Rolling Mill Co., Middletown, Ohio.

Pak-Ice—Machines. Vilter Manufacturing Co., Milwaukee.

Paico Wool—Saferized—Insulation. Pacific Lumber Co., San Francisco, Calif.

Palmaire—Blowers. Palmer Mfg. Co., Phoenix, Ariz.

Panelray—Wall Heaters. Day & Night Mfg. Co., Monrovia, Cal.

Papico — Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Par—Compressors. Lynch Manufacturing Corp., Defiance, Ohio.

Paramount — Flashing. Flemm Lead Company, Inc., Long Island City, N. Y.

Paramount—Flashings. Rochester Lead Works, Inc., Rochester, N. Y.

Paramount — Hollow Metal Windows. Willis Mfg. Co., Galesburg, Ill.

Parasol—Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Parco—Skylight Lifts. Park City Cornice Works, Inc., Bridgeport, Conn.

Par-Exc — Oil Furnaces. Interstate Metal Products Co., Inc., Chicago, Ill.

Parkerizing—Metal treating processes. Parker Rust-Proof Co., Detroit, Mich.

Parkspray—Humidistats and hygrometers. Parks-Cramer Co., Fitchburg, Mass.

Patterson — Roofing Clips. American Sheet Metal Works, New Orleans, La.

Payne-A-Vent — Fittings. Payne Furnace Co., Inc., Beverly Hills, Calif.

Payneheat—Heating Units. Payne Furnace Co., Inc., Beverly Hills, Calif.

Pecos—Low-Tin Solder. National Lead Co., New York City.

Peer—Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.

Peerless—Circulating Coal Heaters. Independence Stove & Furnace Co., Independence, Mo.

Peerless—Blowers, Washers. New York Blower Co., Chicago, Ill.

Peerless—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

Penetrol—Paint. Flood Co., Cleveland.

Penflex — Metal Hose. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Penglass — Round "Accererator" Roof and "Relief" Ridge Ventilators. Pennsylvania Wire Glass Co., Philadelphia.

Penn-Aire—Furnaces. Union Mfg. Co., Boyertown, Pa.

Penn-Mont—Slate. Structural Slate Co., Pen Argyl, Pa.

Penn Packaged Heat—Air Conditioners, Oil Burners, Furnaces, Heaters. Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.

PennSalt—Rust Preventive Chemicals and Cleaners. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Penteo — Combination Snips and Punches. Penn Tool Company, Philadelphia, Pa.

Perfection—Eaves Trough Fittings and Accessories. Iwan Brothers, South Bend, Ind.

Perfection—Electrodes, Rivets. Anthony Carlin Co., Cleveland.

Perfection — Mineral Wool Insulation. Riverton Lime & Stone Co., Inc., Riverton, Va.

Perfect-Lap Two-Drain—Steel Roofing. Milcor Steel Co., Milwaukee, Wis.

Permaglas—Water Heaters. A. O. Smith Corporation, Milwaukee.

Permo-Aire—Filters. Air Devices, Inc., New York, N. Y.

Perry—Damper Clips and Tips. Griswold Mfg. Co., Erie, Pa.

Pet—Oil Burners. Aldrich Co., Wyoming, Ill.

Peteo — Baffles, Interlocking Combustion Chambers. B. A. Peterson Co., Dowagiac, Mich.

Petro — Oil Burners, Furnaces and Water Heaters. Petroleum Heat & Power Co., Stamford, Conn.

Pexto—Metal Workers' Machines and Tools. Peck, Stow & Wilcox Co., Southington, Conn.

Philco-York — Unit Air Conditioners. Philco Corp., Philadelphia, Pa.

Pickle Polish—Stainless Cleaner. American Chemical Paint Co., Ambler, Pa.

Pilot—Fans, Blowers and Motors. F. A. Smith Mfg. Co., Inc., Rochester, N. Y.

Pioneer—Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.

Planeweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Plasteel—Roofing. Protected Steel Products, Washington, Pa.

Plaster Bonds — Compounds. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastic-Calk — Caulking Compounds. Chamberlin Company of America, Detroit.

Plastic Elastigum — Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastic PB—Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastiklast—Roof Cement and Waterproofing Compound. Acorn Refining Co., Cleveland, O.

Plastikon—Glazing Compound. B. F. Goodrich Co., Akron, O.

Plastikroof—Roofing Paint. Evercrete Corporation, New York, N. Y.

Plastiktrim—Plastic Mouldings, Trim, and Tubing and Fittings. R. F. Werner Co., New York, N. Y.

Plastite—Caulking Compounds. U. S. Stoneware Co., Akron, O.

Plastoid—Compounds, Furnace Cement. Plastic Products Co., Detroit, Mich.

Plexiform — Blowers. Bayley Blower Co., Milwaukee, Wis.

Pliavane—Grilles and Registers. Tuttle & Bailey, Inc., New Britain, Conn.

Plicast—Hearth Cement Refractories. Plibrico Jointless Firebrick Co., Chicago, Ill.

Plicast L-W-I—Insulating Refractory. Plibrico Jointless Firebrick Co., Chicago, Ill.

Plisulate—Insulating Cement. Plibrico Jointless Firebrick Co., Chicago.

Pluramelt—Stainless Clad Sheets. Allegheny Ludlium Steel Corp., Pittsburgh, Pa.

Poeco — Insulation. C. W. Poe Co., Cleveland, O.

Polair—Air Conditioning Units. Pernot and Rich, Inc., Los Angeles, Calif.

Polar Giant — Air Conditioning Units. Giant Manufacturing Co., Council Bluffs, Ia.

Porto-Shear—Electric Shears. Van Dorn Electric Tool Co., Towson, Md.

Positive Arc—Arc Welders. Welding Apparatus Co., Chicago, Ill.

"Power-Flex"—Stokers. Link-Belt Co., Chicago, Ill.

Power Krafter — Snips & Shears. Klenk's Aviation Snips, Wilmington, Del.

Powerstat—Valves. Mercoid Corp., Chicago, Ill.

Precipitron — Automatic Air Filter. Westinghouse Electric, Cleveland.

Premier—Electrodes and Welding Rod. American Steel & Wire Co., Cleveland, O.

Premier — Furnace Vacuum Cleaner. Electric Vacuum Cleaner Co., Inc., Cleveland, O.

Premier Automatik—Stoker-Fired Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Premier DeLuxe — Furnaces. Premier Furnace Co., Dowagiac, Mich.

Premier Master — Furnaces. Premier Furnace Co., Dowagiac, Mich.

Pre-Notch—Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.

Preprite — Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.

Prepwash—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.

Presatico—Furnace and Roof Cement, Compounds, Paint. Presstite Engineering Co., St. Louis, Mo.

Presteel—Metal Stampings. Worcester Pressed Steel Co., Worcester, Mass.

Presdwoods—Insulation Board. Masonite Corp., Chicago.

Presteel — Fan Housings. Commercial Shearing & Stamping Co., Youngstown, Ohio.

Prest-O-Lite—Soldering Coppers, Soldering Torches, Welding Equipment. Linde Air Products Co., New York, N. Y.

Prest-O-Weld—Oxy-Acetylene Welding Equipment, Torches. Linde Air Products Co., New York, N. Y.

Princo—Hydrometers, Psychrometers, Electric Relays, Thermometers and Themostats. Precision Thermometer and Instrument Co., Philadelphia, Pa.

Properaire — Blowers. Grand Rapids Die & Tool Co., Grand Rapids, Mich.

Protectolite — Thermostats. Sampsel Time Control, Inc., Spring Valley, Ill.

Protector—Snow Guards. David Levow, New York, N. Y.

Protectorelay — Electric Relays. Minneapolis - Honeywell Regulator Co., Minneapolis, Minn.

Proxlin—Enamels & Lacquers. Acme White Lead and Color Works, Detroit, Mich.

Pul-Air—Ventilators. Lyons, Conklin & Co., Inc., Baltimore, Md.

Pul-Air—Ventilators. Penn Ventilating Co., Philadelphia, Pa.

Pul-Air Ridge—Ventilators. Penn Ventilating Co., Philadelphia.

Pulverzone—Stokers. American Coal Burner Co., Chicago, Ill.

Punchawl—Tools. Hub Specialty Co., Somerville, Mass.

Punkah — Louvres. Kelvin-White Co., Boston, Mass.

Puraire—Blower-Filters. Korts Blower Mfg. Co., Grand Rapids, Mich.

Pure-Dure—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Purox—Oxy-Acetylene Welding Equipment and Torches. Linde Aid Products Co., New York, N. Y.

Pyralux—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.

Pyrobar—Roofing Tile. United States Gypsum Co., Chicago, Ill.

Pyrotron — Temperature Recorders. Bailey Meter Co., Cleveland, O.

Q

Q-Chrome—Insulating Cement. Quigley Company, Inc., New York, N. Y.

Q-Chromatic — Insulating Cement. Quigley Company, Inc., New York, N. Y.

Q-Deck—Roofing. H. H. Robertson Co., Pittsburgh, Pa.

Q-T Ductliner—Celotex Corp., Chicago, Ill.

Quad—Furnace Blowers. Trade-Wind Motorfans, Inc., Los Angeles.

Quadrill — Four-Position Turret Drill Head. Chicago Precision Equipment Co., Chicago.

Quaker Burnoil — Oil Burners, Furnaces and Heaters. Quaker Mfg. Co., Chicago, Ill.

Quaker City—Eaves Trough and Gutters, Conductor Fittings and Accessories, Pipe, Ridge Rolls and Ridging. Berger Brothers Company, Philadelphia, Pa.

Queen City—Shears. Niagara Machine & Tool Works, Buffalo, N. Y.

Quick Acting — Screw Clamps. Horst Mehl Mfg. Co., New York.

Quick-As-Wink—Solenoid Valves. C. B. Hunt & Son, Salem, O.

Quick Heat—A. C. Furnace. American Stove Co., Loraine, O.

Quick Heater—Oil Burners. Quick Furnace & Supply Company, Des Moines, Iowa.

Quick-Set—Dividers. Reiner & Campbell, Inc., Elizabeth, N. J.

Quickwork—Shears and Sheet Metal Machines. Whiting Corporation, Harvey, Ill.

Quiet May—Oil Burners. May Oil Burner Div., Gerotor May Corp., Baltimore.

Quiet Zone—Blowers. Palmer Manufacturing Co., Phoenix, Ariz.

"Quilt"—Insulation. Samuel Cabot, Inc., Boston, Mass.

R

R & G — Grilles, Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

RBC—Bearings. Roller Bearing Co. of America, Trenton, N. J.

r/h — Furnaces. Rybolt Heater Company, Ashland, Ohio.

R.I.W.—Paint and Waterproofing. Toch Bros., Inc., Elm Pk., S. I., N. Y.

R. I. W. Liquir Konkerit—Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.

R. I. W. Plug-A-Leak—Roofing Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.

R & I—Furnace Cement and Insulation. Refractory & Insulation Corp., New York, N. Y.

R & I—Nutipe—Combustion Chambers. Refractory & Insulation Corp., New York, N. Y.

R & M—Motors. Robbins & Myers, Inc., Springfield, O.

R.M.C.—Burners. Rotary Mfg. Co., Los Angeles, Calif.

RP—Filters. Research Products Corporation, Madison, Wis.

RPM—Flashing and Roofing Steel. H. H. Robertson Co., Pittsburgh, Pa.

R-R-M — Hygrometers, Psychrometers. The Palmer Thermometers, Inc., Cincinnati, O.

R-U-F — Fans and Ventilators. Reed Unit-Fans, Inc., New Orleans, La.

Race—Air Conditioning Units and Gas Furnaces. Royal Air Conditioning Equipment, Alhambra, Calif.

Racine—Stokers. Nelson Bros. & Strom Co., Racine, Wis.

Radiation Discs—Stoker Baffles. Munn and Steele, Inc., Newark, N. J.

Radi-Ion—Ozone Apparatus. Montgomery Brothers, San Francisco, Calif.

Radolite—Insulating Cement and Refractories. Tyrolite Products Co., Cleveland, O.

Radiant Heat—Baffles. Jones Products Company, Ferndale, Mich.

Rainbow Mist—Nozzles. National Engineering & Manufacturing Co., Kansas City, Mo.

Raintite — Roof Ventilators. Aeolus Dickinson, Chicago, Ill.

Ralpo—Sheet Metal Cutters. Ralph W. Poe, Canton, Ill.

Ramco — Chimney Caps and Tops. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Ranarex—CO_2 Analyzers. Permutit Co., New York, N. Y.

Ransome-Forster—Gas Burners. Ransome Co., Emeryville, Calif.

Rawl-Anchors — Bolts. Rawlplug Company, Inc., New York, N. Y.

Rawl-Drive—Masonary Nails and Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.

Rawl-Tapers—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.

Reactance Arc—Portable Welders. Miller Electric Mfg. Co., Inc., Appleton, Wis.

Reco — Fans and Motors. Reynolds Electric Co., Chicago, Ill.

Recoy—Air Conditioning Units and Coils. Refrigeration Economics Co., Inc., Canton, O.

Red Devil — Furnace Cement. Pecora Paint Co., Philadelphia, Pa.

Redflash—Gas Burners. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Redi—Stokers. General Machinery Co., Spokane, Wash.

Redi-Lift — Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

Redi-Nail—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

Redi-Paint—Prime Paint for Galvanized Surfaces. Turco Products, Inc., Los Angeles, Calif.

Redi-Set — Rivet Squeezer. Whitney Metal Tool Co., Rockford, Ill.

Red Metallic — Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.

Redox—Paint. Thompson & Co., Pittsburgh, Pa.

Red-Reading-Mercury — Hygrometers, Psychrometers and Thermometers. The Palmer Thermometers, Inc., Cincinnati, O.

Red Seal—Sheets. Benjamin Wolff and Company, Chicago, Ill.

Red Top — Thermostats. H-B Instrument Company, Philadelphia, Pa.

Red X—Cleaners and Polishers. Turco Products, Inc., Los Angeles, Calif.

Reed—Micrometers. George Scherr Co., Inc., New York City.

Reformend—Electrodes. Arcos Corp., Philadelphia, Pa.

Rego — Brazing Torches. National Cylinder Gas Co., Chicago, Ill.

Rego — Flux. Bastian-Blessing Co., Chicago, Ill.

Reillaloy—Stove and Furnace Repairs. Pittsburgh Furnace Parts Co., Pittsburgh, Pa.

Renu—Filters. American Air Filter Co., Inc., Louisville, Ky.

Renuvent—Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.

Republic — Gas Conversion Burners. Autogas Corp., Chicago, Ill.

Republic-Taylor—Terne Roofing Plates. Republic Steel Corporation, Cleveland, O.

Resiscote—Paint. Reilly Tar & Chemical Corporation, Indianapolis, Ind.

Rex—Bearings, Pillow Blocks, Blower-Filter Units, Blowers, Fan-Filter Units, Blower Wheels. Air Controls, Inc., Cleveland, O.

Rex—Bearings, Couplings and Nozzles. Chain Belt Co., Milwaukee, Wis.

Rex-Airate — Fans, Ventilators. Air Controls, Inc., Cleveland.

Rex—Electric Water Heaters. Cleveland Heater Co., Cleveland.

Rex-Air-Pak—Blower Units. Air Controls, Inc., Cleveland, O.

Rexco—Refractories. Rex Clay Products Co., Detroit, Mich.

Rexide—Metal Protecting Paint. A. C. Horn Co., Long Island City, N. Y.

Rexoil—Oil Burners, Furnaces. Reif-Rexoil, Inc., Buffalo, N. Y.

Rex-Roto—Combustion Chambers, Refractories. Rex Clay Products Co., Detroit, Mich.

Rex-Tube — Flexible Duct Connectors. Chicago Metal Hose Corp., Maywood, Ill.

Rexvane—Blowers. B. F. Sturtevant Co., Boston, Mass.

Rex Vibra-Sorbers — Vibration Eliminating Metal Hose. Chicago Metal Hose Corporation, Maywood, Ill.

Rexwelders—Spot Welders. Rex Welder & Engineering Co., Kansas City, Mo.

Reyn-O-Cell — Insulation. Reynolds Metals Co., Richmond, Va.

Resistal — Stainless Steels. Crucible Steel Co. of America, New York, N. Y.

Rhinamel—Enamels. Tropical Paint & Oil Co., Cleveland, O.

Rhino — Caulking and Glazing Compounds. Pecora Paint Co., Philadelphia, Pa.

Rich-Con—Ventilators. A-J Mfg. Co., Kansas City, Mo.

Ridgelator — Ridge Roof Ventilator. Klauer Mfg. Co., Dubuque, Ia.

Rigidized — Metals. Rigid-Tex Corp., Buffalo.

Rincon-trol — Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.

RIP-Clean—Filters. Research Products Corporation, Madison, Wis.

Rip-o-Lin—Enamels. Glidden Company, Cleveland, O.

Rip-pl—Enamels, Lacquers and Paints. Hilo Varnish Corp., Brooklyn, N. Y.

Riverside—Furnaces. Des Moines Stove Repair Co., Des Moines.

Rivnut—Blind Fasteners. B. F. Goodrich Co., Akron, Ohio.

Robinson—Brakes, Presses and Dies, Punches. New Albany Machine Mfg. Co., New Albany, Ind.

Rollaire — Air Conditioning Furnaces. Hipoint Corp., Bellefontaine, O.

Roof Flange — Flashing. Eagle-Picher Co., Cincinnati, O.

Roofkoter — Paint. Tropical Paint & Oil Co., Cleveland, O.

Roof-Vent — Ventilators. Reed Unit-Fans, Inc., New Orleans, La.

Rosetop — Ventilators. Danner Metal Works Co., Hagerstown, Md.

Rotary—Gravity Ventilators. The Swartwout Co., Cleveland, O.

Rotary Suction—Ventilators. F. O. Schoedinger, Columbus, O.

Rotex—Punches and Shears. M. Bollaert, Oakland, Calif.

Roto—Insulating Cement and Combustion Chambers. Rex Clay Products Co., Detroit, Mich.

Roto-Blast — Furnaces. Moncrief Furnace Co., Atlanta, Ga.

Roto-Clone—Dust Collectors. American Air Filter Co., Inc., Louisville, Ky.

Rotojet—Nozzles. Binks Mfg. Co., Chicago, Ill.

Roxaprene—Enamels and Lacquers. Roxaline Flexible Finishes, Inc., Elizabeth, N. J.

Royal—Caulking Compounds, Cement, Enamels, Lacquers, Waterproofing, Paint. A. Wilhelm Co., Reading, Pa.

Royal—Furnaces. Hart & Crouse Corporation, Utica, N. Y.

Royalastic—Roof Cement. A. Wilhelm Co., Reading, Pa.

Royalbestos—Furnace Cement. A. Wilhelm Co., Reading, Pa.

Royal Blue—Acid and Furnace Brushes. Schaefer Brush Mfg. Co., Milwaukee, Wis.

Royal Clipper—Metal Cutter. C-B Tool Co., Lancaster, Pa.

Rubalt—Enamels, Lacquers and Paint. Alfred Hague & Co., Inc., Brooklyn, N. Y.

Rubalt RA — Paint. Alfred Hague & Co., Inc., Brooklyn.

Rubatex—Insulation. Virginia Rubatex Div., Great American Industries, Inc., Bedford, Va.

Rubber-in-Shear — Vibration Isolating Pads. Korfund Co., Long Island City.

Rubber Putty—Glazing Compound. B. F. Goodrich Co., Akron, O.

Rubyfluid—Solder, Soldering Flux, Tinning Compounds. Ruby Chemical Co., Columbus, O.

Rudico—Furnaces. Rudy Furnace Co., Dowagiac, Mich.

Rudisteel — Furnaces. Rudy Furnace Co., Dowagiac, Mich.

Rusco—Windows. Russell Co., F. C., Cleveland, O.

Rustnil—Paints. National Engineering Products, Inc., Washington, D. C.

Rysdon—Ventilators. Sioux Steel Co., Sioux Falls, S. D.

S

S — Sheets. The Superior Sheet Steel Co., Canton, O.

S C — Furnaces. Surface Combustion, Toledo, O.

S.D.T.—Freeze Proof — Coils. John J. Nesbitt, Inc., Philadelphia.

S-E—Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

SF—Soldering Coppers, Torches, Welders. Sight Feed Generator Co., Richmond, Ind.

S. I. S.—Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

S-L — Bar Folders, Nibblers, Slitting Machines. St. Louis Tool Co., St. Louis, Mo.

S-N—Furnaces, Oil Burners, Stokers. Scott-Newcomb, Inc., St. Louis, Mo.

S O S—Variable Speed Pulleys. Ideal Commutator Dresser Co., Sycamore, Ill.

SRP—Metal Protecting Paint. L. Sonneborn Sons, Inc., New York, N. Y.

Safety Circle—Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Saf-ty—Mallets. Martin Bersted Co., Chicago, Ill.

St. Clair—Circulating Heaters. Enterprise Foundry, Inc., Belleville, Ill.

St. Louis — Stoker. Ormsby-Osterman Co., St. Louis, Mo.

Sair Seal—Insulating Cement. A. P. Green Fire Brick Co., Mexico, Mo.

Sal-Mo—Cement, Insulation, Pipe Coverings. Sall Mountain Co., Chicago, Ill.

Samco — Cement. Standard Asbestos Mfg. Co., Chicago, Ill.

Sampson—Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Sanidaire—Humidifiers. U. S. Air Conditioning Corp., Minneapolis, Minn.

saran—Plastic Tubing and Fittings. Acadia Synthetic Products Div., Chicago, Ill. Commercial Plastics Co., Chicago. Skuttle Mfg. Co., Detroit, Mich. Hodgman Rubber Co., Framingham, Mass.

Satis-Fyre—Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

Sauter—Time Switches. R. W. Cramer Co., Inc., Centerbrook, Conn.

Sav-Haf — Oil Burners. Aldrich Co., Wyoming, Ill.

Saw-Chief—Hack Saws. Chicago Precision Equipment Co., Chicago.

Saw-Gun — Power Saw. Mid-States Equipment Co., Chicago.

Seniflux—Soldering Flux. Scaife Co., Oakmont, Pa.

Schmidt—Soldering Coppers, Soldering and Brazing Torches. Minn-Kōta Foundry & Mfg. Co., Fargo, N. D.

Sco-Co—Roof Cement, Compounds, Paint, Roofing and Waterproofing. Southport Paint Co., Savannah, Ga.

Scribus-Dividus — Scribers, Dividers, Calipers, Wiggler. Nork Products Co., Los Angeles.

Scroll-Pivoter—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Scruplex—Fans and Ventilators. L. J. Wing Mfg. Co., New York, N. Y.

Sea-Lion—Leather Belting. Chicago Belting Co., Chicago.

Seal Master—Bearings. Stephens-Adamson Mfg. Co., Aurora, Ill.

Seal of Quality — Roofing. Columbia Steel Co., San Francisco, Calif.

Sealpruf—Waterproofing. General Insulating Products Co., Brooklyn, N. Y.

Seal-Tite—Registers. Char-Gale Mfg. Co., Minneapolis, Minn.

Seal-Tite—Roof Cement. C. Arthur Miller & Son, Elmira, N. Y.

Seamless — Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

Season-stat—Limit Controls. L. J. Mueller Furnace Co., Milwaukee.

Security—Caulking and Roofing. National Mfg. Corp., Tonawanda, N. Y.

Seisme-Dampers — Vibration Isolating Bases. Korfund Co., Inc., Long Island City, N. Y.

Selectair—Air Conditioning Units and Oil Furnaces. S. T. Johnson Co., Oakland, Calif.

Select-O-Speed—Variable Speed Pulleys. Ideal Commutator Dresser Co., Sycamore, Ill.

Self-Cleaning—Furnaces. Moore Corp., Joliet, Ill.

Selflube — Sleeve Bearings. Keystone Carbon Co., Inc., St. Marys, Pa.

Self-Seal Re-Fil-Able — Filters. Research Products Corporation, Madison, Wis.

Selfvule — Waterproofing Compounds, Paint. Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.

Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.

Semco—Crimping and Slitting Machines, Presses and Dies, Punches, Snips and Shears. Service Machine Co., Elizabeth, N. J.

Sensatherm — Thermostats. Mercoid Corp., Chicago, Ill.

Sensitrol—Electrical Relays. Weston Electrical Instrument Corp., Newark, N. J.

Sentinel — Floor Furnaces. Stoker-Lad Co., Tacoma, Wash.

Sentry—Furnaces. Payne Furnace Co., Beverly Hills, Calif.

Series "H"—Coils. John J. Nesbitt, Inc., Philadelphia, Pa.

Series "W"—Coils. John J. Nesbitt, Inc., Philadelphia, Pa.

70 Serviceman—Recording Thermostat. Jas. P. Marsh Corp., Chicago, Ill.

Serviron—Plastic Coating. Saverite Engineering Co., Hoboken, N. J.

Sheetrock—Duct Board. United States Gypsum Co., Chicago, Ill.

Shield-Arc — Electrodes and Welders. Lincoln Electric Co., Cleveland, O.

Shock Absorbing—Pillow Blocks. Triangle Mfg. Co., Oshkosh, Wis.

Shock Pads—Vibration Isolating Pads. Vibration Control Co., New York, N. Y.

Shower-Proof—Paint. Calbar Paint & Varnish Co., Philadelphia, Pa.

Shur-Heat—Stokers. Air Conditioning & Stokers, Inc., St. Louis, Mo.

Shut-O-Vent — Louvers and Shutters. Reed Unit-Fans, Inc., New Orleans, La.

Sievert — Soldering Furnaces and Torches. J. A. Sanders, Fulton, N. Y.

Silent—Furnace Blowers. Air Conditioning Equipment Co., Minneapolis, Minn.

Silent Air — Fans. Belanger Fan & Blower Co., Detroit, Mich.

Silentair—Blowers, Filters. Gehri Co., Tacoma, Wash.

Silentaire—Window Ventilator and Filter Units. Berger Mfg. Div., Republic Steel Corp., Canton, O.

Silent-Auburn—Oil Burners, Furnaces, Heaters. Auburn Burner Co., Auburn, Ind.

Silent Automatic — Fire Doors and Shutters. Meyer Mfg. Co., Detroit, Mich.

Silent Automatic—Louvers & Shutters. Airecon Industries, Inc., Detroit, Mich.

Silentblu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Silent Breeze—Ventilating Fans. Holcomb & Hoke Mfg. Co., Indianapolis.

Silentvane—Blowers. B. F. Sturtevant Co., Boston, Mass.

Silere—Fans. Aire-Foile Fan & Blower Company, Detroit, Mich.

Sil-Fos—Solder. Handy & Harman, New York, N. Y.

Silicair — Insulation. Western Silicair Products, Inc., Burbank, Calif.

Silicon Bronze—Bolts. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Siloy-Soder—Solder. L. B. Allen Co., Inc., Chicago, Ill.

Silver-Lume — Paint. Wilbur & Williams Co., Boston.

Silver-Soder—Solder. L. B. Allen Co., Inc., Chicago, Ill.

Silver Steel—Saws. E. C. Atkins & Co., Indianapolis, Ind.

Silvertile—Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Simplex — Quadrants. Ohio Products Co., Cleveland, O.

Simplate—Pneumatic Hammer. Chicago Pneumatic Tool Co., New York, N. Y.

Simplex—Humidifiers. Henry Kraker, Holland, Mich.

Simplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Simplex—Stoker. Stoker Products, Inc., Decatur, Ill.

Sim-trol—Barometric Dampers. Simplex Mfg. Co., Fond du Lac, Wis.

Sioux—Drills, Grinders, Sanders. Albertson & Co., Inc., Sioux City, Ia.

Sirocco—Air Conditioning Units, Blowers, Fans, Ventilators, Washers. American Blower Corp., Detroit, Mich.

Sisalation—Reflective Insulation. Sisalkraft Co., Chicago.

SkilDrill—Electric Drill. Skilsaw, Inc., Chicago, Ill.

SkilGrinders — Electric Grinders. Skilsaw, Inc., Chicago.

SkilNibbler—Electric Cutters. Skilsaw, Inc., Chicago.

SkilSanders — Electric Sanders. Skilsaw, Inc., Chicago.

SkilShear — Electric Saws. Skilsaw, Inc., Chicago.

SkilTools — Portable Saws. Skilsaw, Inc., Chicago.

Slaters' Felt—Insulation. Barrett Div. Allied Chemical & Die Corp., New York, N. Y.

Smith & Hemenway—Tools. Crescent Tool Co., Jamestown, N. Y.

Smith's—Cleat Benders. R. E. Smith, Waukegan, Ill.

Smith's—Torches, Welders and Equipment. Smith Welding Equipment Co., Minneapolis, Minn.

Smithway — Water Storage Heaters, Stokers, Welders. A. O. Smith Corp., Milwaukee.

Snap Action—Humidifier Valves. McDonnell & Miller, Chicago.

Snaplok — Furnace Pipe. Reeves Steel & Mfg. Co., Dover, O.

Snapon—Mouldings & Trim. John Lees Div., Serrick Corp., Muncie, Ind.

Snap-Rite — Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.

Snap-Tite—Damper Regulators, Clips and Tips. M. A. Gerett Corp., Milwaukee, Wis.

Sno-Breze—Coils, Evaporative Coolers. Palmer Mfg. Corp., Phoenix, Ariz.

Sno-Fluxx — Evaporative Cooler Mats. Palmer Mfg. Corp., Phoenix, Ariz.

Snug-Fit — Coils. Hotstream Heater Co., Cleveland, O.

Soder—Solder. L. B. Allen Co., Inc., Chicago.

Softweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Sol-Air—Floor Furnaces. Utility Appliance Corporation, Los Angeles.

Solaraire — Air Conditioning Furnace. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Solderprep — Flux for Steel. Neilson Chemical Co., Detroit, Mich.

Solex—Heat Insulating Windows. Pittsburgh Plate Glass Co., Pittsburgh.

Solid Asphalt — Waterproofing. Ford Roofing Products Co., Chicago, Ill.

Solid Comfort — Furnaces. May-Fiebeger Co., Newark, O.

Sono-O-Seal—Insulation. General Insulating Products Co., Brooklyn, N. Y.

Soroco — Chimney Caps and Tops. Southbridge Roofing Co., Southbridge, Mass.

So Salts—Tinning Compound and Flux. Turco Products, Inc., Los Angeles, Calif.

Southaire—Stokers. E. E. Souther Iron Co., St. Louis, Mo.

Sovaklor—Metal Protecting Paint. Socony Paint Products, New York, N. Y.

Sovalex—Metal Protecting Paint. Socony Paint Products, New York, N. Y.

Spacesaver—Heating Unit. Payne Furnace Co., Beverly Hills, Calif.

Spartan—Kitchen Exhaust Fan. F. A. Smith Mfg. Co., Rochester, N. Y.

Spartan—Water Heaters. Continental Water Heater Co., Ltd., Los Angeles.

Spatter-Nox—Welding Compound. Universal Power Corp., Cleveland, O.

Spatter-Off—Welding Compound. Universal Power Corp., Cleveland, O.

Special X—Solder. Industrial Service Laboratories, Milwaukee, Wis.

SpecO — Soldering Flux. Pfanstiehl Chemical Co., Waukegan, Ill.

Spedene—Glazing Compound. Glidden Co., Cleveland, O.

Speedare—Electrodes. Universal Power Corporation, Cleveland, O.

Speed Clips—Spring Steel Fastenings. Tinnerman Products, Inc., Cleveland, O.

Spee Dee—Coils. Air Controls, Inc., Cleveland, O.

Speed-heat—Furnaces. Marshall Furnace Co., Marshall, Mich.

Speedmaster — Variable Speed Pulleys. DoAll Company, Minneapolis, and Des Plaines, Ill.

Speed Nuts—Sheet Metal Nuts. Tinnerman Products, Inc., Cleveland, O.

Speed-Up—Concrete Waterproofing Cement. Hilo Varnish Corp., Brooklyn, N. Y.

Speedweld—Mild Steel Welding Rods. Trindl Products, Ltd., Chicago.

Sphinx—Blower-Filter Units, Burners, Furnaces. C. L. Bryant Corp., Cleveland, O.

Spinner—Ventilators. Milcor Steel Co., Milwaukee, Wis.

Spirovane—Ventilating Fans. Western Blower Co., Seattle, Wash.

Sprague—Furnaces. Katelman Foundry & Mfg. Co., Council Bluffs, Ia.

Sprayit—Paint Guns, Humidifiers, Nozzles. Electric Sprayit Co., Sheboygan, Wis.

Spra-Rite — Nozzles. Binks Mfg. Co., Chicago, Ill.

Stable-Arc — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Stackmaster — Furnace Regulator. Campbell Eng. Co., Appleton, Wis.

Staidarc—Electrodes. Universal Power Corporation, Cleveland, O.

Staidarc—Electrodes. Universal Power Corporation, Cleveland, O.

Stainlend—Electrodes. Arcos Corporation, Philadelphia, Pa.

Stainweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Sta-Lock — Prefabricated Ducts and Duct Fittings. Chicago Furnace Supply Co., Chicago, Ill.

Stamco—Furnace Pipe, Fittings. Cincinnati Stamping Co., Cincinnati, O.

Stamco—Sheet and Plate Machinery. Streine Tool & Mfg. Co., New Bremen, O.

Standard—Furnaces. Aladdin Heating Corp., Oakland, Calif.

Standard — Furnaces. Farris Furnace Co., Springfield, Ill.

Standard—Furnaces. Home Furnace Co., Holland, Mich.

Standard—Ventilators. Allen Corp., Detroit, Mich.

Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.

Star—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

Star—Ventilators. Merchant & Evans Co., Philadelphia, Pa.

Statick — Ventilators. Hirschmann-Pohle Co., Inc., LeRoy, N. Y.

Staxausters — Ventilators. Allen Corporation, Detroit.

Staynew—Filters. Dollinger Corporation, Rochester, N. Y.

Steel Cable—V-Belts. Goodyear Tire & Rubber Co., Inc., Akron, O.

Steelcore — Galvanized Steel Shingles. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Steel-Fin—Heating Coils. New York Blower Co., Chicago, Ill.

Steelmaster—Shingles and Tile. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Steel Mixture—Baffles and Refractories. McLeod & Henry Co., Inc., Troy, N. Y.

Steelweld — Brakes. Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, Ohio.

Sterling — Evaporative Coolers and Compressors. Reynolds Mfg. Co., Springfield, Mo.

Sterling Beader—Beading Machines. F. L. Robertson, Buffalo, N. Y.

Steward—Presses and Dies. Ward Machinery Co., Chicago, Ill.

Stewart—Furnaces. Fuller-Warren Co., Milwaukee, Wis.

Stic-Tite—Cement. Refractory & Insulation Corp., New York, N. Y.

Stokabilt—Air Conditioning Stoker Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

Stok-A-Timer—Stoker Controls. Mercoid Corp., Chicago, Ill.

Stoker Economy—Stoker Furnaces. International Heater Co., Utica, N. Y.

Stoker Fire — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Stoker-Ola—Stokers. Advance Appliance Co., Peoria, Ill.

Stokerator—Domestic Stokers. Northern Steel & Stoker Corp., Peoria, Ill.

Stokerelay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Stokermatic — Furnaces and Stokers. Rheem Manufacturing Co., Salt Lake City.

Stokol - Hydraulic — Stokers. Stokol Stoker Co., Inc., Indianapolis, Ind.

Stokol - Mercury — Stokers. Stokol Stoker Co., Inc., Indianapolis, Ind.

StoneTex — Concrete Waterproofing. Truscon Laboratories, Detroit.

Stonewall — Asbestos-Cement Board. Ruberoid Co., New York, N. Y.

StormSeal — Roofing Steel. Columbia Steel Co., San Francisco, Calif., and American Steel and Wire Company, Cleveland.

Stormtight—Roof Cement. L. Sonneborn Sons, Inc., New York, N. Y.

Stowaway — Attic Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Strate-Edge — Eaves Trough and Gutters. Milcor Steel Co., Milwaukee, Wis.

Strato-Liminator—Air Diffusers. Wilster, Inc., Cleveland, O.

Streamaire — Air Conditioning Units and Coils. Young Radiator Co., Racine, Wis.

Stream-Flo — Ventilators. The Allen Corporation, Detroit, Mich.

Streamjet—Nozzles. Spraying Systems Co., Chicago.

Streamline—Furnaces. Aladdin Heating Corp., Oakland, Calif.

Streamline—Ridge Ventilators. H. H. Robertson Co., Pittsburgh, Pa.

Streamline—Tubing and Fittings. Mueller Brass Co., Port Huron, Mich.

Streamlined—Furnaces. Sure Comfort Furnace Co., Forest Park, Ill.

Streamlined — Oil Burners. Shedlove Oil Burners, Inc., Minneapolis.

Streekno—Register Packing. Excel Heating & Air Conditioning Co., Chicago, Ill.

Stubby—Floor Furnace. Holly Heating & Mfg. Co., Pasadena, Calif.

Sturdybender — Presses, Brakes. Cyril Bath & Co., Cleveland, O.

Sullare—Electrodes. Universal Power Corporation, Cleveland, O.

Sullivan—Draft Stabilizer. Cole-Sullivan Engineering Co., Minneapolis.

Sunbeam — Furnaces, Blower-Filters, Oil Burners, Heaters and Humidifiers. American Radiator and Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Allerton—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Arlington—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Bayport — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Chippewa—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Cliffdale — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Clifton—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Elmwood — Oil Floor Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Kenwood—Furnaces, Heaters. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Longwood—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Mohawk — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Saginaw — Gas Floor Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Saratoga — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Seneca—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Shawnee — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam - Westmoreland — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Wyandotte—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sun-Blaze—Furnaces. Harvey-Whipple, Inc., Springfield, Mass.

Sun Flame—Gas Water Heater. American Gas Machine Co., Albert Lea, Minn.

Sun Fuel Master — Furnaces and Heaters. J. V. Patten Co., Sycamore, Ill.

Sunglo—Furnaces. Moore Corp., Joliet, Ill.

Sunlight—Motors. Packard Electric Div., General Motors Corp, Detroit.

Sunrise—Gas and Oil Burners. Kals Sunrise Works, Detroit, Mich.

Super—Drill Grinders. Crandall Mfg. Co., Los Angeles.

Super—Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Super—Plastic Furnace Lining. Walsh Refractories Corp., St. Louis, Mo.

Super — Pneumatic Tools. Keller Tool Company, Grand Haven, Mich.

Superair — Air Conditioning Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Superair — Blower-Filter Units. The Majestic Co., Huntington, Ind.

Super Air Screws — Ventilating Fans. Marathon Electric Mfg. Corp., Wausau, Wis.

Superbrite — Aluminum Paint. Acorn Refining Co., Cleveland, O.

Superbrite No. 150 — Metal Protecting Paint. Acorn Refining Co., Cleveland, O.

Superfex—Furnaces, Heaters. Perfection Stove Co., Cleveland, O.

Superfin—Furnaces. American Fdry. & Furnace Co., Bloomington, Ill.

Super Firma—Gravity Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Superflux N. O. 215 — Soldering Flux. Paul Lewis Laboratories, Inc., Milwaukee, Wis.

Superheat—Furnaces. Dallman Supply Co., Sacramento, Calif.

Superior — Enamels. Blue Ridge Talc Co., Inc., Henry, Va.

Superior—Furnaces. Naco Manufacturing Co., Huntington Park, Calif.

Superior—Blowers. American Foundry & Furnace Co., Bloomington, Ill.

Superior — Sheets. Continental Steel Corp., Kokomo, Ind.

Superior—Soldering Furnaces and Torches. P. Wall Mfg. Supply Co., N. S. Pittsburgh, Pa.

Superlife—Furnace. Excelsior Steel Furnace Co., Chicago, Ill.

Super-Nickel — Fittings. American Brass Co., Waterbury, Conn.

Super-Por-Seal—Waterproofing. Truscon Laboratories, Detroit.

Super-Quiet—Oil Burners. Green Colonial Furnace Co., Des Moines, Ia.

Super Red Streak — Furnace Cleaners. National Super Service Co., Toledo, O.

Super Sioux—Ventilators. Sioux Steel Co., Sioux Falls, S. D.

Super-Thermo — Refractory. Chicago Fire Brick Co., Chicago, Ill.

Super X—Industrial Coating. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Super-X—Roofing Nails. Republic Steel Corporation, Cleveland, O.

Super X — Sheets. Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.

Supreme — Enamels. Blue Ridge Talc Co., Inc., Henry, Va.

Supreme—Furnaces. American Furnace & Foundry Co., Milan, Mich.

Supreme—Furnaces, Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Supreme—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Sure Draft—Chimney Tops. H. C. Little Burner Co., Inc., San Rafael, Calif.

Sureweld—Arc Welding Electrodes. National Cylinder Gas Co., Chicago, Ill.

Surfaceoil — Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

Surfaceweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

SuVeneer — Clad Sheets. Superior Steel Corp., Pittsburgh.

Swanee—Galvanized Shingles. Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.

Sylphon—Controls, Damper Regulators, Thermostats and Valves. Fulton Sylphon Co., Knoxville, Tenn.

Symentrex—Waterproofing Compounds. A. C. Horn Co., Long Island City, N. Y.

Symonds—Registers. Front Rank Furnace Co., Div., Liberty Foundry Co., St. Louis, Mo.

Synchron—Stoker Controls, Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

Synchron "600"—Timing Machines and Motors. Hansen Mfg. Co., Inc., Princeton, Ind.

SyncreTizer—School Room Heaters. John J. Nesbitt, Inc., Philadelphia, Pa.

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Tag—Controls, Humidistats, Hygrometers, Recorders, Psychrometers, Thermometers, Thermostats and Gas Pressure Regulating Valves. C. J. Tagliablue Div., Brooklyn, N. Y.

Tamanite—Metal Conditioner. Tamms Silica Company, Chicago, Ill.

Tamco—Ventilators. Tiffin Art Metal Co., Tiffin, Ohio.

Tampico—Filters. Chicago Filter Co., Joliet, Ill.

Tam-Putty — Caulking Compound. Tamms Silica Company, Chicago.

Tanco — Paint. Thompson & Co., Pittsburgh, Pa.

Taylor — Roofing Ternes. Republic Steel Corporation, Cleveland, O.

Techni-Louvre—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Techni-Turn—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Techni-vane—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Technotrol—Electric Clock Thermostat. White Mfg. Co., St. Paul, Minn.

Tee Joint—Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.

Telemaster—Relays. Tork Clock Company, Inc., Mount Vernon, N. Y.

Teltru—Psychrometers and Thermometers. E. Vernon Hill, Chicago, Ill.

Tem-Clock — Controls. Penn Electric Switch Co., Goshen, Ind.

Temco—Furnaces. Tennessee Enamel Mfg. Co., Nashville, Tenn.

Temlok—Insulation. Armstrong Cork Co., Lancaster, Pa.

Tempered-Aire—Furnaces. Gar Wood Industries, Inc., Detroit, Mich.

Tempryte—Heat Insulating Windows. Truscon Steel Co., Youngstown, O.

Temtrol—Thermostats. Penn Electric Switch Co., Goshen, Ind.

10-Plastic—Caulking Compounds. Quigley Co., Inc., New York, N. Y.

Tension-Lap — Roofing Steel. Inland Steel Company, Chicago.

Tensulate—Insulation. Tennessee Products Corp., Nashville, Tenn.

Texrope—V-Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Textolite—Sheets, Rods and Tubes. General Electric Co., Plastics Div., Pittsfield, Mass.

Thareo—Furnace Cement. The Armstrong Company, Detroit, Mich.

The General—Furnaces. General Heating Products Co., Minneapolis, Minn.

"The Pacific"—Furnaces. W. W. Rosebraugh Co., Salem, Ore.

Therma-Flo—Circulating Heaters. Utility Appliance Corp., Los Angeles, Calif.

Thermalfuel—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermek—Coils. Peerless of America, Inc., Marion, Ind.

Thermascrete No. 20 — Refractories. Munn and Steele, Inc., Newark, N. J.

Thermidaire—Air Conditioning Units, Blowers, Coils, Furnaces, Louvres & Shutters. E. K. Campbell Heating Co., Kansas City, Mo.

Thermix—Dust Collectors. Prat-Daniel Corporation, Port Chester, N. Y.

Thermo—Furnaces. American Furnace Co., St. Louis, Mo.

Thermo—Gas Soldering Furnace. Ward Machinery Co., Chicago, Ill.

Thermoanemometer — Anemometer, Willson Products, Inc., Reading, Pa.

Thermo-Draulic — Controls, Damper Motors and Regulators. Perfex Corporation, Milwaukee, Wis.

Thermo-Drip — Humidifier. Automatic Humidifier Co., Cedar Falls, Ia.

Thermodrive—Variable Speed Pulleys. Webster Electric Co., Racine, Wis.

Thermo-Flex — Registers. Middleton Mfg. & Sales Co., Minneapolis, Minn.

Thermogas—Furnaces. Beck Engineering Combustion Kompany, St. Louis Mo.

Thermogrip—Soldering Coppers. Ideal Commutator Dresser Co., Sycamore, Ill.

Thermohm—Psychrometers. Leeds & Northrup Co., Philadelphia, Pa.

Thermo-Humidigraph — Humidity Recorders. Bristol Co., Waterbury, Conn.

Thermoil—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.

Thermopaste—Plastic Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Thermopilot—Controls. General Controls Co., Glendale, Calif.

Thermo-Slab—Roofing Tile. Devoe & Raynolds Co., Inc., New York.

Thermotite—Insulation. Coast Insulating Corp., Los Angeles, Calif.

Thermovents—Heaters. John J. Nesbitt, Inc., Philadelphia.

Thin-Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Thor—Electric Buffers, Nibblers, Hammers, Tools. Independent Pneumatic Tool Co., Chicago.

3-M—Grinding and Finishing. Minnesota Mining & Manufacturing Co., St. Paul.

Three-Phase—Welders. Sciaky Bros. Chicago.

3000—Refractories. Refractory & Insulation Corporation, New York, N. Y.

370 Special—Paints. Thompson & Co., Pittsburgh, Pa.

Thrift—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Throway—Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.

Tik Wheat—Pipe Covering Paste. Clark Stek-O Corp., Rochester, N. Y.

Tileo-Fin — Coils. Extended Surface, Inc., Brooklyn.

Tillery's—Furnace Clock. Little Janitor Furnace Clock Co., New York, N. Y.

Timercold—Time Clock. Mercoid Corp., Chicago, Ill.

Timerelay — Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Time-Saver—Damper Quadrants. Goose Mfg. Co., Milwaukee, Wis.

Timetrol—Switches. Penn Electric Switch Co., Goshen, Ind.

Ti-Namel — Vitreous Enameling Alloy Steel Sheets. Inland Steel Co., Chicago.

Tin-Ezy—Tinning Compound. Lloyd S. Johnson Co., Chicago.

Tinezy—Solder and Flux. Farrelloy Co., Inc., Philadelphia.

Tin Loy—Tinning Compounds. Eagle-Picher Co., Cincinnati, O.

Tinol—Compounds and Soldering Flux. American Solder & Flux Co., Philadelphia, Pa.

Tite—Caulking Compounds. J. H. Krehbiel Co., Chicago, Ill.

Tite-Lite—Glazing Compounds. Truscon Laboratories, Detroit.

Titelock—Fittings and Accessories for Conductor, Eaves Trough and Gutter, Furnace Pipe, Copper Roofing. Milcor Steel Co., Milwaukee, Wis.

TiteSeal—Caulking Compounds. Radiator Specialty Co., Charlotte, N. C.

Tobin Bronze—Plates and Welding Rod. American Brass Co., Waterbury, Conn.

Tocol—Waterproofing Compounds. Protective Coatings, Incorporated, Detroit, Mich.

Tomb Brand—Insulation. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Toncan Iron—Roofing, Sheets. Republic Steel Corp., Cleveland, O.

Toolarc — Electrodes. Universal Power Corp., Cleveland.

Toolweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Top-Notch—Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.

Toridaire—Furnaces. Fraser and Johnston Co., San Francisco, Calif.

Torid-Cast — Refractories. Walsh Refractories Corp., St. Louis, Mo.

Toridheet — Blower-Filters, Burners, Furnaces and Heaters. Cleveland Steel Products Corp., Cleveland.

Tornado — Furnace Vacuum Cleaners. Breuer Electric Mfg. Co., Chicago, Ill.

Torrid — Soldering Furnaces and Torches. Geo. W. Diener Mfg. Co., Chicago, Ill.

Torrid Zone—Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Totalume—Aluminum Paint. Wilbur & Williams Co., Boston.

Totrust—Paints, Enamels. Wilbur & Williams Co., Boston.

Townley — Ventilators. A-J Mfg. Co., Kansas City, Mo.

Transite—Duct Board, Pipe and Fittings. Johns-Manville, New York, N. Y.

Transparent—Air Filter Gauge. F. W. Dwyer Mfg. Co., Chicago, Ill.

Trico — Furnaces. Tri-State Heating Supply Co., Fort Wayne, Ind.

Tri-Flux—Soldering Flux. Wolfe-Kote Co., Sheboygan, Wis.

Trimtherm—Thermostats. General Controls Co., Glendale, Calif.

Trindl Arc—Torches. Trindl Products, Ltd., Chicago.

Trindl Super — Arc Welders. Trindl Products, Ltd., Chicago.

Triple A—Paints, Enamels and Lacquers, Compounds. Quigley Co., Inc., New York, N. Y.

Triple Drain—Channel Roofing. Republic Steel Corp., Cleveland, O.

Triple Lock—Roofing Nails. The Deniston Co., Chicago, Ill.

Triple-Mix — Furnace Cement. J. H. Krehbiel Co., Chicago, Ill.

Triplex—Furnaces. Home Furnace Co., Holland, Mich.

Tripl-ife—Furnaces. Williamson Heater Co., Cincinnati, O.

Tripitrol—Controls. White Mfg. Co., St. Paul, Minn.

Triumph—Furnaces. Joseph Capps, Inc., South Gate, Calif.

Trojan—Furnaces and Stokers. Auburn Burner Co., Auburn, Ind.

Trojan—Ventilators. Danzer Metal Works Co., Hagerstown, Md.

Tropic Breeze—Furnaces. Dalzen Tool & Manufacturing Co., Detroit, Mich.

Truflex—Thermostatic Bi-Metals. General Plate Div. Metals & Controls Corp., Attleboro, Mass.

Tuberator—Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.

Tufternell—Paint. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Tulox—Plastic Tubing. Extruded Plastics, Inc., Norwalk, Conn.

Turbo—Air Washers, Spray Nozzles. Bayley Blower Company, Milwaukee, Wis.

Turbo-Lift—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.

Turbovane—Blowers. B. F. Sturtevant Co., Boston, Mass.

Turret — Water Circulating Pumps. Yeomans Bros. Co., Chicago, Ill.

20th Century—Bearings. Roller Bearing Co. of America, Trenton, N. J.

Twin Contact—Controls, Relays, Thermostats. Perfex Corporation, Milwaukee, Wis.

Twin Control—Oil Burners. H. J. Hueller Mfg. Co., Inc., Brooklyn, N. Y.

Twin-Fyre—Oil Burner. Aldrich Co., Wyoming, Ill.

Two-Way—Pneumatic Hammer. Coast Pneumatic Tool Co., Los Angeles.

Tygon—Metal Protecting Paint. U. S. Stoneware Co., Akron, Ohio.

Tyl-Lyke—Steel Roofing and Siding. Continental Steel Corp., Kokomo, Ind.

Tymotherm—Thermostats. Tork Clock Company, Inc., Mount Vernon, N. Y.

Type X — Stainless Cleaner. Turco Products, Inc., Los Angeles, Calif.

Tytecote — Reflective Blanket Insulation. Specialty Converters, Inc., East Braintree, Mass.

U

U.S.—Pipe Fittings, Grilles, and Registers. United States Register Co., Battle Creek, Mich.

USG—Built-Up Roofing and Roof Cement and Paint. United States Gypsum Co., Chicago, Ill.

U.S.S. — Nails, Roofing, Sheets, Plates, Wire. Subsidiaries, U. S. Steel Corporation.

U.S.S. American—Nails. American Steel & Wire Co., Cleveland, O.

U.S.S. Carilloy — Alloy Plates. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.

U. S. S. Columbia — Roofing, Sheets. Columbia Steel Co., San Francisco, Calif.

U.S.S. Paintbond — Sheets. Carnegie-Illinois Steel Corporation, Pittsburgh, Pa.

U.S.S. Stormseal — Steel Roofing. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.

U.S.S. Tenneseal — Roofing. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

U.S.S. Vitrenamel — Sheets. Carnegie-Illinois Steel Corporation, Pittsburgh, Pa.

Ucilon — Coatings and Paint. United Chromium, Incorporated, New York City.

U-In-Tah — Paint. American-Marietta Co., Chicago.

U-Loy — Sheets. Republic Steel Corp., Cleveland, O.

UMCO—Furnaces. Union Manufacturing Co., Boyertown, Pa.

"U" Tube — Water Heaters. Handley Brown Heater Co., Jackson, Mich.

Unamatic — Automatic Shielded Arc Welding. Una Welding, Inc., Cleveland, O.

Uniduct—Prefabricated Ducts. General Heating Products Co., Minneapolis, Minn.

Unifil—Insulation. Robinson Insulation Co., Great Falls, Mont.

Uni-Fin—Grilles and Warm Air Registers. Barber-Colman Co., Rockford, Ill.

Uniflex—Roofing Paint. Acorn Refining Co., Cleveland, O.

Uni-flo — Duct Turning Vanes, Grilles and Registers. Barber-Colman Company, Rockford, Ill.

Unilloy—Stainless Steel Sheets. Universal-Cyclops Steel Corp., Bridgeville, Pa.

Unipack—Blowers, Exhausters. American Machine Products Co., Marshalltown, Iowa.

Unique—Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago, Ill.

Unishear — Portable Electric Shears. Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.

Unisorb—Bases and Pads and Duct Insulation. Felters Co., Boston, Mass.

Unitaire — Air Conditioning Units for Stores. B. F. Sturtevant Div., Westinghouse Electric, Boston.

Uni-Therm—Air Cond. Furnace. Utility Appliance Corp., Los Angeles, Calif.

Universal — Angle Benders. Hossfeld Mfg. Co., Winona, Minn.

Universal — Bases. Vibration Control Company, New York City.

Universal—Coils. Aerofin Corporation, Syracuse, N. Y.

Universal—Dial Damper. Parker-Kalon Corp., New York, N. Y.

Unxid — Damper Quadrants. Parker-Kalon Corp., New York, N. Y.

Upson—Rivets, Bolts. Republic Steel Corp., Cleveland, O.

usAIRco — Air Conditioning Units, Blowers and Blower-Filter Units, Coils, Fans, Grilles, Washers and Blower Wheels. U. S. Air Conditioning Corp., Minneapolis.

Utilus—Kitchen Exhaust and Ventilating Fans. Hischman-Pohle Co., Inc., LeRoy, N. Y.

V

V-Drain — Roofing. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

V-Vent — Ventilators. Aeolus Dickinson, Chicago, Ill.

Vacu-Draft—Forced Draft Blowers. Muncie Gear Works, Inc., Muncie, Ind.

Valcalox — Damper Regulators. Young Regulator Co., Cleveland, O.

Valdura—Caulking Compounds, Paint. American-Marietta Co., Chicago, Ill.

Valley Forge—Cement. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

Vanatta Qwikheat—Electric Soldering Iron. Sound Equipment Corp., Glendale, Cal.

Vanco Duratite — Skylights. E. Van Noorden Co., Boston.

Vanco Syphon—Ventilators. E. Van Noorden Co., Boston.

Vanco Superflo—Ridge Ventilators. E. Van Noorden Co., Boston.

Vanco Upblast—Ventilators. E. Van Noorden Co., Boston.

Vapoglas — Humidifier Evaporating Plates. Skuttle Mfg. Co., Detroit, Mich.

Vaporator—Humidifiers. Rudy Furnace Co., Dowagiac, Mich.

Vari-Pitch — Speed Changers. Allis-Chalmers Mfg. Co., Milwaukee.

Vedoc—Enamels. Ferro Enamel Corp., Cleveland, O.

Veejet—Nozzles. Spraying Systems Co., Chicago.

Veelos — Adjustable V-Belts. Manheim Mfg. & Belting Co., Manheim, Pa.

Velometer—Anemometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Venetian — Cement Paint. E. D. Coddington Mfg. Co., Milwaukee, Wis.

Ventair—Fans. West Wind Corporation, Seattle.

Ventube—Rubberized Tubing. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Venetian—Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.

Ventura—Fans, Ventilators. American Blower Corp., Detroit, Mich.

Venturi-Flo — Air Diffusers, Ceiling Ventilators, Duct Turning Vanes. Barber-Colman Company, Rockford, Ill.

Vernois — Furnaces and Heaters. Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Versa-Tool — Portable Electric Drill. York Electric and Machine Co., York, Pa.

Verti-Bay—Coils. Vilter Manufacturing Co., Milwaukee.

Vertivent—Ventilators. Young Radiator Co., Racine, Wis.

Vibracork—Bases. Armstrong Cork Co., Lancaster, Pa.

Vibro-Bars—Vibration Isolating Bases. Korfund Co., Inc., Long Island City.

Vibro-Dampers — Vibration Isolating Bases. Korfund Co., Inc., Long Island City.

Vibro-Insulators — Vibration Insulating Pads. B. F. Goodrich Co., Akron, O.

Vibro-Isolator—Vibration Isolating Bases. Korfund Co., Inc., Long Island City.

Victor—Blower-Filter Units, Furnaces, Humidifiers, Oil Burners, Stokers, Hall-Neal Furnace Co., Indianapolis, Ind.

Victoraire—Winter Air Conditioners. Hall-Neal Furnace Co., Indianapolis, Ind.

Victorgas—Gas Units. Hall-Neal Furnace Co., Indianapolis, Ind.

Victor Jumbo—Large Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.

Victoroil — Air Conditioning Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.

Victorstoke — Stoker Units. Hall-Neal Furnace Co., Indianapolis, Ind.

Victory—Oil Burners. Caloroil Burner Corp., Hartford, Conn.

Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Vigoraire—Furnaces. Marshall Furnace Co., Marshall, Mich.

Vik-O-Matic—Stokers. Viking Manufacturing Corporation, Cleveland.

Vincul—Rustproofing. Protective Coatings, Inc., Detroit.

Visaflame—Oil Burner Controls. Mercoid Corp., Chicago, Ill.

Vitalaire — Portable Room Cooler. Ice Cooling Appliance Corp., Morrison, Ill.

Vitra-Carlite — Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Vitriset—Furnace Cement. U. S. Stoneware Co., Akron, Ohio.

Vitroliner — Vent and Flue Pipe and Fittings. Condensation Engineering Corp., Chicago, Ill.

Volcano—Chimney Caps and Tops, Ventilators. Iwan Brothers, South Bend, Ind.

Velocitrol — Stack-Head Damper. Barber-Colman Co., Rockford, Ill.

Vortex—Furnace Vacuum Cleaners. B. F. Sturtevant Co., Hyde Park, Boston, Mass.

Vortex—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York City.

Vulcanite — Roofing, and Roofing Cement. Certain-teed Products Corp., New York City.

Vulcatex—Caulking and Glazing Compounds. A. C. Horn Co., Long Island City, N. Y.

Vulco—V-type Belts and Pulleys. Gates Rubber Co., Denver, Colo.

Vulco Etch—Welding Compounds. Turco Products, Inc., Los Angeles, Calif.

W

W—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.

WAW—Tools. W. A. Whitney Mfg. Co., Rockford, Ill.

W. O. No. 1—Rust Preventive Chemicals. Turco Products, Inc., Los Angeles, Calif.

Warco — Refractories. Walsh Refractories Corp., St. Louis, Mo.

Ward Zephyr — Attic Fans. Edgar T. Ward Co., Inc., River Forest, Ill.

Warrior—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Wateo—Spray Nozzles. Water Cooling Corp., New York City.

Waterbase—Furnaces. Farris Furnace Co., Springfield, Ill.

Water-Boy — Humidifier Valves. Maid-O'-Mist, Inc., Chicago, Ill.

Waterbury — Oil Burners, Cabinets, Casings, Ducts and Fittings, Pipe, Pipe Fittings and Accessories, Furnaces and Heaters. Waterman-Waterbury Co., Minneapolis, Minn.

Water-RAY-trola — Oil-fired Water Heater. Ray Oil Burner Co., San Francisco, Calif.

Waterseal—Cement. Thompson & Co., Pittsburgh, Pa.

Waterspar — Enamels and Lacquers. Pittsburgh Plate Glass Co., Pittsburgh.

Watertender—Humidifier Valve. Skuttle Mfg. Co., Detroit, Mich.

Wearweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Wearwell — Paint. Thompson & Co., Pittsburgh, Pa.

Weathercote — Waterproofing Compounds. Glidden Co., Cleveland, O.

Weathermakers — Air Conditioning Units. Carrier Corp., Syracuse, N. Y.

Weather-Seal — Roof Cement. Acme White Lead & Color Works, Detroit, Mich.

Weatherwood — Insulation. United States Gypsum Co., Chicago, Ill.

Webster—Spray Nozzles and Air Washers. W. J. Strandwitz & Co., Inc., Camden, N. J.

Wedgbelt—Belts and Pulleys. American Pulley Co., Philadelphia, Pa.

Weir — Air Conditioning Furnaces, Gravity Furnaces, Heaters, Humidifiers, Stokers. Meyer Furnace Co., Peoria, Ill.

Weiralead—Sheets. Weirton Steel Co., Weirton, W. Va.

Weircoloy—Copper Bearing Galvanized Sheets. Weirton Steel Co., Weirton, W. Va.

Weirite—Tin Plate. Weirton Steel Co., Weirton, W. Va.

Weir-Meyer Heat — Furnaces. Meyer Furnace Co., Peoria, Ill.

Weirzin — Electrolitic Zinc Coated Sheets. Weirton Steel Co., Weirton, W. Va.

Weisco — Skylight Lifts. H. Weiss & Co., New York, N. Y.

Weld-Craft — Welders. Allied Weld-Craft, Inc., Indianapolis, Ind.

Weldon—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Weld-o-trol—Spot Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Weld-O-Tron—Arc Welders. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Wellsville Savage—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Wesco — Blower Filters. Northwest Foundry & Furnace Works, Inc., Portland, Ore.

Wesco — Furnaces. John Westwick & Son, Inc., Galena, Ill.

Wesco—Furnaces. General Wesco Stove Co., Springfield, Mo.

Wesco Diamond—Furnaces. Northwest Foundry & Furnace Works, Portland, Ore.

Wesco Duplex—Utility Room Furnaces. Northwest Foundry & Furnace Works, Portland, Ore.

Wesco Hiboy — Furnaces. Northwest Foundry & Furnace Works, Inc., Portland, Ore.

Western Fan — Roof Fan Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.

Western King—Furnaces. Independence Stove & Furnace Co., Independence, Mo.

Western Turbine—Gravity Roof Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.

Westernaire Exhausters — Ventilating Fans. Western Engineering & Mfg. Co., Los Angeles, Calif.

Westwind—Fans. West Wind Corporation, Seattle.

Wetoil—Soldering Flux. Farrelloy Co., Inc., Philadelphia.

Whirlcone — Spray Nozzles. Water Cooling Equipment Corp., St. Louis, Mo.

Whirljet — Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Whitney-JENSEN — Angle Benders, Brakes, Elbow Machines, Punches, Shears and Tools. Whitney Metal Tool Co., Rockford, Ill.

Whiz—Electric Drills. Paramount Products Co., New York City.

Wiechert—Furnaces, Heaters. St. Clair Foundry Corp., Centralia, Ill.

Wilhelm — Furnace Cement. Glidden Co., Cleveland, O.

Wilson — Arc Welders. Air Reduction Sales Company, New York City.

Wilson — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Wind Electric — Roof Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Wind-O-Fan, Jr.—Window Ventilating Fan. Chelsea Fan & Blower Co., Inc., Irvington, N. J.

Wind-O-Vane Jr.—Kitchen Exhaust Fans. B. F. Sturtevant Co., Hyde Park, Mass.

Wind-O-Vent—Ventilator Units. Reed Unit-Fans, Inc., New Orleans, La.

Winkler—Stokers. U. S. Machine Corporation, Lebanon, Ind.

Winter-Chaser — Furnaces, Heaters. Campbell Heating Co., Des Moines, Ia.

Winter King — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Witch—Bolts. Carpenter & Paterson, Inc., East Boston, Mass.

Wizard — Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Wolfe—Angle Meter, Circle Meter, Divisor, Protractor. Interstate Sales Co., New York City.

Wolverine—Fans, Exhausters, Ventilators. Belanger Fan & Blower Co., Detroit, Mich.

Wolverine—Furnaces. Marshall Furnace Co., Marshall, Mich.

Woolfelt—Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.

X

XL — Metal Windows. Herrmann & Grace Co., Brooklyn, N. Y.

X-L-All — Furnaces. Deshler Foundry & Machine Works, Deshler, Ohio.

Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

X-Pandoseal—Transparent Waterproofing. X-Pando Corp., Long Island City.

XX—Punches. Parker-Kalon Corp., New York.

Y

Yager's — Flux. Alex R. Benson Co., Inc., Hudson, N. Y.

Yankee — Damper Clips and Tips. Howes-Woods Company, Cambridge, Mass.

Yankee — Damper Regulators. Ohio Products Co., Cleveland, O.

YarWay—Nozzles. Yarnall-Waring Co., Philadelphia, Pa.

Yearound — Air Conditioning Units. Conditionaire Unit Co., Chicago, Ill.

Yoloy — Plates. Youngstown Sheet & Tube Co., Youngstown, Ohio.

Yorkaire Conditioners—Air Conditioning Units. York Corp., York, Pa.

YouBert — Collectors and Blow Pipe Fittings. Young & Bertke Co., Cincinnati, O.

Z

ZTO Chromate—Metal Protecting Paint. New Jersey Zinc Co., New York City.

Zeph-Air—Gas Furnace. XXth Century Heating & Ventilating Co., Akron, O.

Zeph-O-Cone—Diffusers. Waterloo Register Co., Waterloo, Ia.

Zeph-Oil-Ator — Air Conditioning Furnaces. Century Engineering Corp., Cedar Rapids, Ia.

Zephyr—A. C. Stoker Furnace. Premier Furnace Co., Dowagiac, Mich.

Zephyr — Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.

Zero—Furnace and Insulating Cement and Refractories. Standard Fuel Engineering Co., Detroit, Mich.

Zilloy—Zinc Roofing. New Jersey Zinc Co., New York City.

Zinc Chromate Primer—Metal Protecting Paint. Hilo Varnish Corp., Brooklyn, N. Y.

Zincgrip—Steel Sheets. American Rolling Mill Co., Middletown, O.

Zoneair—Furnaces. Payne Furnace Co., Inc., Beverly Hills, Calif.

Zonolite — Cement Combustion Chambers, Insulation and Refractories. Universal Zonolite Insulation Co., Chicago; and Munn and Steel, Inc., Newark, N. J.

Zonolite—Insulation. Robinson Insulation Co., Great Falls, Mont.

Zonolite—Insulation. Western Mineral Products Co., Omaha, Nebr.

Z-Ro King—Furnaces. Oakland Foundry Co., Belleville, Ill.

Zura — Roofing Paint. L. Sonneborn Sons, Inc., New York City.

Section of

American Artisan

1946 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 3—MANUFACTURERS' ADDRESSES]

A

A-C Mfg. Co., Inc., 417 Sherman Ave., Pontiac, Ill.
A-J Manufacturing Co., 2119 Washington St., Kansas City, Mo.
A & J Company, 844 W. 59th St., Chicago 21.
Abbott Mfg. Co., Drawer 150, Painesville, O.
Acadia Synthetic Products Div., Western Felt Works, 4115 Ogden Ave. Chicago.
• Accurate Mfg. Works, 2336-38 Milwaukee Ave., Chicago 47.
Accurate Metal Weather Strip Co., 216 E. 26th St., New York City 10.
Acer & Whedon, Inc., Commercial St., Medina, N. Y.
Ackermann Manufacturing Company, Wheeling, W. Va.
Acme Asbestos Covering & Flooring Co., 222 Elizabeth St., Chicago 7.
Acme Electric Heating Co., Inc., 1205 Washington St., Boston 18.
• Acme Electric Welder Co., 2618 Fruitland Rd., Los Angeles 11
Acme Industries, Inc., Mechanic & Ganson Sts., Jackson, Mich.
Acme Oil Burner Co., Inc., 210 Third Ave., S. W., Cedar Rapids, Ia.
Acme Refining Co., W. 56th & W&LE Ry., Cleveland.
Acme Tin Plate & Roofing Supply Co., 3rd & Westmoreland Sts., Philadelphia 40.
Acme White Lead & Color Works, 8250 St. Aubin Ave., Detroit 11.
Acme Wire & Iron Works, Canfield & Moran, Detroit 7.
Acorn Refining Co., 8001 Franklin Blvd., Cleveland 2.
• Adams Co., The, East 4th St., Dubuque, Ia.
Adams Mattress Factory, Fort Worth, Texas.
Adel Precision Products Corp., 10777 Van Owen St., Burbank, Calif.
Adelta Manufacturing Co., Ellsworth St. at 21st, Philadelphia 46.
Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago 32.
Advance Appliance Co., Inc., 808-810 S. Washington St., Peoria, Ill.
Advance Electric and Relay Co., 1260 W. 2nd St., Los Angeles 26.
Advance Fan & Blower Co., 3428 Bagley, Detroit.
Advance Insulating Co., 714 Magee Bldg., Pittsburgh.
• Aeolus Dickinson, 3320 S. Artesian Ave., Chicago 8.
• Aerofin Corp., 410 S. Geddes St., Syracuse, N. Y.
Aeroil Products Co., Park Ave. at 57th St., West New York, N. J.
Aeroquip Corp., East St., Jackson, Mich.
Aerovent Fan Co., 710 E. Ash St., Piqua, O.
Aget-Detroit Co., 602 First National Bank Bldg., Ann Arbor, Mich.
Agnew Electric Co., Milford, Mich.
Agricola Furnace Co., Inc., North 12th St., Gadsden, Ala.
Ahlberg Bearing Co., 3012 W. 47th St., Chicago 32.
Air Conditioning Equip. Co., P. O. Box 1123, Minneapolis 1.
• Air Conditioning Products Co., 2340 W. Lafayette Blvd., Detroit 16.
Air Conditioning and Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
Air Conditioning & Stokers, Inc., 1610 Tower Grove Ave., St. Louis.
• Air Control Products, Inc., Coopersville, Mich.
• Air Controls, Inc., 2310 E. Superior Ave., Cleveland 14.
• Air Devices, Inc., 17 E. 42nd St., New York City 17.
Airecon Industries Incorporated, 2536 Fourteenth St., Detroit 16.
Air Filter Corporation, 2154 W. Lisbon Ave., Milwaukee 5.
Air Filter Engineering Co., 2450 S. Prairie Ave., Chicago 16.
Aire-Foile Fan & Blower Co., 4737 W. Vernor Highway, Detroit.
Airgard Manufacturing Co., 362 W. Erie St., Chicago 10.
Airmaster Corp., 4317 Ravenswood Ave., Chicago 13.
Air-Maze Corp., 5200 Harvard Ave., Cleveland 5.
Air-O-Cell Industries, Inc., 11616 Cloverdale Ave., Detroit.
Airo-Fin Grille Co., 21700 Wyoming, Detroit 20.
Air Reduction Sales Co., 60 E. 42nd St., New York City 17.
Air & Refrigeration Corp., 475 Fifth Ave., New York City 17.
Air-Speed Tool Co., 1028 W. Slauson Ave., Los Angeles 44.
Air Stream Filter Corp., 2100 Washington Ave., St. Louis 3.
• Airtemp Div. Chrysler Corp., 119 Leo St., Dayton 1, O.
• Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10.
Airwasher Corporation, 1122 N. Washington Ave., Lansing 5, Mich.
Ajax Building Bracket Co., 1551 Rydal-Mount Rd., Cleveland Heights 18, O.
Ajax Flexible Coupling Co., Westfield, N. Y.
Aladdin Heating Corp., 2222 San Pablo Ave., Oakland, Calif.
Albertson & Co., Inc., Sioux City Iowa.
Alco Manufacturing Co., 2619 Milam St., Houston, Tex.
Alco Valve Co., 865 Kingsland Ave., St. Louis 5, Mo.
Alden Manufacturing Co., Painesville, Ohio.
Aldrich Co., Wyoming, Ill.
Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
AleXite Engineering Co., Alexander Film Building, Colorado Springs, Colo.
Alfol Insulation Co., Inc., 155 E. 44th St., New York City.
Allegheny Ludlum Steel Corp., P. O. Box F, Brackenridge, Pa.
Allen Billmyre Co., 431 Fayette Ave., Mamaroneck, N. Y.
Allen-Bradley Co., 1335 S. First St., Milwaukee, Wis.
Allen, Inc., Charles I., Pequabuck, Conn.
Allen, H. D., 3201 Casitas Ave., Los Angeles 26.
• Allen Co., Inc., L. B., 6702 Bryn Mawr Ave., Chicago 31.
Allen Corp., 9752 Erwin, Detroit 13.
Allen Stoker Co., 235 S. Penn St., Allentown, Pa.
Allied Heating & Air Conditioning Co., 14807 Condon Ave., Lawndale, Calif.
Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 4.
Allington & Curtis Mfg. Co., 1500 Holland Ave., Saginaw, Mich.
Allis-Chalmers Manufacturing Company 575, Milwaukee 1.
Allis Co., Louis, 427 Stewart St., Milwaukee 7.
Allmetal Weatherstrip Co., 2241 N. Knox Ave., Chicago 39.
Allred Manufacturing Company, Inc., 2154 N. Sherman Dr., Indianapolis.
All States Roofers Equipment & Material Co., 2107 W. Lake St., Chicago.
Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1.
Alphil Spot Welding Co., 431 W. Broadway, New York City 12.
• Alton Manufacturing Co., 111 Camp St., Dallas 2, Tex.
Alton Mineral Wool Insulation Co., P. O. Box 31, Alton, Ill.
Aluminum Co. of America, 801 Gulf Bldg., Pittsburgh 19.
Aluminum Goods Mfg. Co., Manitowoc, Wis.
American Agile Corporation, 5806 Hough Ave., Cleveland 3.
American Air Conditioning Co., 2831 Thirteenth Ave., Minneapolis.
American Air Conditioning Co., Boulevard Bldg., Detroit.
American Air Conditioning Corp., P. O. Box 29, Sebastopol, Calif.
American Air Filter Co., Inc., 113 Central Ave., Louisville 8, Ky.
American Asphalt Roof Corp., 15th & Blue River, Kansas City 3, Mo.
American Blower Corp., Detroit 32.
• American Brass Co., 414 Meadow St., Waterbury 88, Conn.
American Cabinet Hardware Corp., Rockford, Ill.
American Chain Division, American Chain & Cable Co., Inc., York, Pa.
American Chemical Paint Co., Brookside Ave., Ambler, Pa.
American Coal Burner Co., 12 20 E. Erie St., Chicago 11.
American Coils, Inc., 25-27 Lexington St., Newark 5, N. J.
American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City, Mo.
American Emblem Co., Inc., P. O. Box 116M, Utica 1, N. Y.
American Engineering Co., 2446 Aramingo Ave., Philadelphia.
American Excelsior Corp., 100-20 N. Halsted St., Chicago.
American Flexible Coupling Co., 1801 Pittsburgh Ave., Erie, Pa.
American Foundry Equipment Co., 621 Byrkit St., Mishawka, Ind.
American Foundry & Furnace Co., Washington at McClun St., Bloomington, Ill.
• American Furnace Co., 2719-31 Delmar Blvd., St. Louis 3.
American Furnace & Foundry Co., Box 198, Milan, Mich.
American Gas Furnace Co., Elizabeth "B", N. J.
• American Gas Machine Co., 505 Front St., Albert Lea, Minn.
American Hair & Felt Co., 222 N. Bank Dr., Chicago 54.
American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.
American Insulator Corp., New Freedom, Pa.
American-Larson Ventilating Co., 1004 Keystone Bldg., Pittsburgh 22, Pa.
American Machine Products Co., 401 S. Third Ave., Marshalltown, Pa.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

American-Marietta Company, 43 E. Ohio St., Chicago 11.
American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.
American Metal Hose Branch, American Brass Co., 67 Jewelry St., Waterbury 88, Conn.
American Metal Products Co., 730 Hudgins St., Fort Worth 9, Tex.
American Metal Weather Strip Co., 114 N. Division Ave., Grand Rapids 2, Mich.
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• American Monorail Co., 13112 Athens Ave., Cleveland 7.
American Nickeloid Co., 1505 Second St., Peru, Ill.
American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29.
American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30.
• American Rolling Mill Co., 703 Curtis St., Middletown, O.
American Screw Co., 21 Stevens St., Providence, R. I.
American Sheet Metal Works, 331 N. Alexander, New Orleans 1.
• American Smelting & Refining Co., 120 Broadway, New York 5.
American Solder & Flux Co., 2152 East Norris St., Philadelphia.
American Steel Band Co., Box 565, Pittsburgh 30.
American Steel & Wire Co., 614 Superior Ave., N. W., Cleveland 13.
American Stove Co., Lorain Div., 1200 Long Ave., Lorain, O.
American Ventilating Hose Co., 15 Park Row, New York, N. Y.
American Warming & Ventilating Co., 1017 Summit St Toledo 4.
American Zinc Products Co., Greencastle, Ind.
Ames Co., W. R., 150 Hooper St., San Francisco 7.
Ampex Electric & Mfg. Co., 1155 Howard Ave., P. O. Box "A.P," San Carlos, Calif.
Anchor Burner Co., P. O. Box 4, 823 W. California, Oklahoma City 1, Okla.
• Anchor Post Fence Co., Heating Div., Eastern Ave. & Kane St., Baltimore 24, Md.
Anchor Stove & Range Co., Div. Stratton & Terstegge Co., Third & Culbertson, New Albany, Ind.
Andersen Corporation, Bayport, Minn.
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• Anemostat Corp. of America, 10 E. 39th St., New York City 16.
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Aqua-Mist Co., 426 Jefferson St., Topeka, Kan.
Aqua-Sorb Co., 21 S. 16th St., East Orange, N. J.
Arcos Corp., 1515 Locust St., Philadelphia 2.
Arcweld Mfg. Co., Inc., 3469 Third Ave. W., Seattle 99, Wash.
Arex Co., 333 N. Michigan Ave., Chicago.
Armstrong-Blum Mfg. Co., 5700 Bloomingdale Rd., Cragin Sta., Chicago.
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Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., 1649 Olentangy River Rd., Columbus 8, O.
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• Automatic Humidifier Co., 19th & Main Sts., Cedar Falls, Ia.
• Automatic Products Co., 2450 N. 32nd St., Milwaukee 10, Wis.
Automatic Pump & Softener Corp., Rockford, Ill.
Automatic Switch Co., 41 E. 11th St., New York City 3.
Automatic Temperature Control Co., Inc., 44 E. Logan St., Philadelphia 44.
Avery Farm Machinery Co., 2006 S. Washington St., Peoria 2, Ill.

B

B/W Controller Corp., 2200 E. Maple Ave., Birmingham, Mich.
Babbitt Chemical Specialties Co., 630 Fifth Ave., New York 20.
Babcock & Wilcox Co., 85 Liberty St., New York City 6.
Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh 8, Pa.
Bache & Co., Semon, Greenwich & Morton Sts., New York 14.
• Badger Corporation, 327 E. Brown St., Milwaukee 12, Wis.
Badger Mfg. Co., 106 N. Frances St., Madison, Wis.
Baer Brothers, 438 W. 37th St., New York City 18.
Bahnson Co., 1001 S. Marshall St., Winston-Salem, N. C.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Furnace & Cleaner Mfg. Co., 2152 Smead Ave., Toledo, O.
Baker Ice Machine Co., Inc., 1509 Evans St., Omaha, Nebr.
Baldor Electric Co., 4358 Duncan Ave., St. Louis 10, Mo.
Baldwin Belting, Inc., 85 Chambers St., New York 7.
Baldwin-Hill Co., 597 Klagg Ave., Trenton 2, N. J.
Ballantyne Co., 1707-11 Davenport St., Omaha 2, Nebr.
Balloffet Dies & Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Baltimore Enamel and Novelty Co., P. O. Box 928, Baltimore 3, Md.
Banner Repair Parts Co., 103 E. Indianola Ave., Youngstown 7, O.
Bantam Bearings Div., Torrington Co., South Bend 21, Ind.
Barber Co., Inc., 1600 Arch St., Philadelphia.
Barber-Colman Co., River & Loomis Sts., Rockford, Ill.
• Barber Gas Burner Co., 3704 Superior Ave., Cleveland 14.
Barclay, Inc., Robt., 128 N. Peoria St., Chicago 7.
Bardco Mfg. & Sales Co., 2450 E. 23rd St., Los Angeles, Calif.
Bard Mfg. Co., Evansport Road, Bryan, O.
Bardes Range & Foundry Co., E. H., 2619 Colerain Ave., Cincinnati, O.
Bargar Sheet Metal Co., 12401 Euclid, Cleveland.
Barland Weatherstrip Material Co., 1960 E. 59th St., Cleveland 3, O.
Barnard Co., Geo. A., 74 Prescott St., Worcester, Mass.
• Barnes, Inc., H. C., 330 E. 4th St., Long Beach 2, Calif.
Barnes Metal Products Co., 4425 W. 16th St., Chicago 23.
Barnes, W. O., 1297 Terminal Ave., Detroit 14.
Barrett Division, Allied Chemical & Die Corp., 40 Rector St. New York City 6.
Barrett Engineers, 1322 Warrensville Center Rd., Cleveland Heights 21, O.
Barry Furnace Co., 208 N. B St., Hamilton, O.
• Barth Manufacturing Co., Milldale, Conn.
Bartlett Hayward Co., 200 Scott St., Baltimore 3.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2.
Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago 30.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bath Co., Cyril, E. 70th & Machinery Ave., Cleveland 8.
Bayer Co., A. J., Slauson & Santa Fe Aves., Los Angeles.
• Bayley Blower Co., 1817 S. 66th St., Milwaukee 14.
Bayonne Steel Products Co., Clinton & Jelliff Aves., Newark 8, N. J.
Beacon-Morris Corp., 110-114 Brookline Ave., Boston 15.
Bead Chain Mfg. Co., 105 Mountain Grove St., Bridgeport 5, Conn.
Bear Mfg. Co., Industrial Div., 2030 Fifth Ave., Rock Island, Ill.
Bearing Co. of America, 501 Harrisburg Ave., Lancaster, Pa.
Beatrice Steel Tank Mfg. Co., 700 S. 7th St., Beatrice, Nebr.
Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind.
Beck Engineering Combustion Kompany, 2100 Cole St., St. Louis 6.
Beckett Engineering Co., R. W., W. River St., Elyria, O.
Beckett & Co., Thomas, 2118 Griffin St., Dallas 2, Texas.
Beckley Perforating Co., 305 North Ave., Garwood, N. J.
Belanger Fan & Blower Co., 1230 18th St., Detroit 16.
Belco Exhaust Fan Mfg. Co., 3830-32 Olive St., St. Louis 8.
Belden Machine Co., 1108 Whalley Ave., New Haven 15, Conn.
Belfield Co., H., 435 N. Broad st., Philadelphia 23.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Belmont Smelting & Refining Works, Inc., 281 Georgia Ave., Brooklyn 7, N. Y.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.
• Berger Bros. Co., 229-237 Arch St., Philadelphia 6.
Berger Mfg. Div. of Republic Steel Corp., 1038 Belden Ave., N. E., Canton 5, O.
Bergman Tool Mfg. Co., 1573-75 Niagara St., Buffalo 13, N. Y.
Bergstrom Mfg. Corp., Neenah, Wis.
Bern's Specialty Mfg. Co., 2278 Elston Ave., Chicago 14.
Bernz Co., Otto, 280 Lyell Ave., Rochester 6, N. Y.
Berridge Shear Company, Jefferson & St. Joseph Sts., Sturgis, Mich.
Bersted Co., Martin, 341 N. Crawford Ave., Chicago.
Bertram Mfg. Co., 230 E. Ohio St., Chicago.
Bertsch & Co., Church St., Cambridge City, Ind.
Best Register Co., 2005 W. Oklahoma Ave., Milwaukee 7.
Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.
• Bethlehem Steel Co., Bethlehem, Pa.
Betz Corp., 460 State St., Hammond, Ind.
• Beverly Shear Co., 3009 W. 110th Pl., Chicago 43.
Bieler & Son, L., 35-42 41st St., Long Island City 1, N. Y.
Bien Air Conditioning Company, Bell, Calif.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Biggs Supply Co., B. C., Lincoln, Nebr.
Binks Mfg. Co., 3114 Carroll Ave., Chicago 12.
Bird Archer Co., 4337 N. America St., Philadelphia.
Bird & Son, Inc., East Walpole, Mass.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14.
• Black & Decker Mfg. Co., 782 Pennsylvania Ave., Towson 4, Md.
Black Manufacturing Co., 1426 W. Baltimore St., Baltimore 23, Md.
Black Servant Stoker Co., 6504 Olive Blvd., St. Louis 5.
Blake & Johnson Co., Waterville, Conn.
Blake Manufacturing Co., 1600 Mill St., Rock Island, Ill.
Bliss Co., E. W., 1420 Hastings St., Toledo, O.
Blockson & Co., E. Fifth St., Michigan City, Ind.
Blood Brothers Machine Co., Div. Standard Steel Spring Co., Allegan, Mich.
Blower Application Co., 918 N. 4th St., Milwaukee 3.
Blue Ridge Talc Co., Inc., Henry, Va.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12.
Bogue Electric Co., 37 Kentucky Ave., Paterson 3, N. J.
Bohn Aluminum & Brass, Michigan Ave. & Shelby St., Detroit.
Bollaert, M., 4726 E. 12th St., Oakland 1, Calif.
Borm Manufacturing Co., Elgin, Ill.
Bossert Co., Inc., 1002 Oswego St., Utica, N. Y.
Boston Gear Wks., Inc., North Quincy 71, Mass.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47.
Bovee Furnace Works, 130 W. Eighth St., Waterloo, Ia.
Boyd & Co., Inc., Chas. P., 250-252 N. Third St., Philadelphia.
Braden Mfg. Co., 431 N. 14th St., Terre Haute, Ind.
Brasco Mfg. Co., 152nd & Commercial Ave., Harvey, Ill.
• Brauer Supply Co., A. G., 2100 Washington Ave., St. Louis 3.
Breidert, G. C., Co., 634 S. Spring St., Los Angeles 14.
• Bremil Mfg. Co., Box 1030, Erie, Pa.
• Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40.
Bridesburg Foundry Co., Tacony & Duncan Sts., Philadelphia.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport 1, Conn.
Bridgeport Screw Co., Bridgeport, Conn.
Briggs Clarifier Co., Ceramics Sales Div., Bethesda 14, Md.
Briggs Mfg. Co., 11631 Mack Ave., Detroit.
Brigham Oil Burner Co., 3745 Forest Park Blvd., St. Louis.
Bristol Co., P. O. Box 1790, Waterbury 91, Conn.
Brooklyn Metal Ceiling Co., 283-89 Greene Ave., Brooklyn, N. Y.
Brooks Co., Inc., B. D., 361 Atlantic Ave., Boston 10.
Bros Boiler & Mfg. Co., Wm., 1057 Tenth Ave., S. E., Minneapolis 14.
Brown-Appton Co., 681 Fifth Ave., New York City.
Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton, O.
Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., 4443 Wayne Ave., Philadelphia 44.
Brown Steel Tank Co., 2901 S. E. Fourth St., Minneapolis.
Brownell Co., 300 N. Findlay St., Dayton 1, O.
Brownie Stoker Co., 840 N. Morgan St., Decatur, Ill.
Browning Mfg. Co., Inc., Central Ave., Main & Chester Sts., Maysville, Ky.
Brumme Mfg. Co., 1220 E. Empire St., Bloomington, Ill.
• Brundage Co., 500 N. Park St., Kalamazoo 11, Mich.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
• Bruno Tools, 9330 Santa Monica Blvd., Beverly Hills, Calif.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant Corp., C. L., 4610 St. Clair Ave., Cleveland 3.
Bryant Heater Co., Dresser Industries, 17825 St. Clair Ave Cleveland 10.
Buckeye Products Co., 7024 Vine St., Cincinnati 16, O.
Buckeye Tools Corporation, 29 W. Apple St., Dayton 1, Ohio.
Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.
Buffalo Turbine Corp., 2165 Bailey Ave., Buffalo 11.
Buffalo Pumps, Inc., 171 Mortimer St., Buffalo, N. Y.
Buffalo Wire Works Co., 454 Terrace, Buffalo 2.
Burdett Mfg. Co., 19 N. Sheldon St., Chicago.
• Burden Company, 1151 S. Broadway, Los Angeles 15.
Burgess-Norton Mfg. Co., 773 Peyton St., Geneva, Ill.
Burgess Soldering Furnace Co., 292 E. Long St., Columbus 15, O.
Burke Electric Co., 1201 W. 12th St., Erie, Pa.
Burke Stoker & Mfg. Co., 921 W. 19th St., Chicago.
Burnham Stoker Co., 505 Columbia St., Vancouver, Wash.
Burnley Battery & Mfg. Co., Clay St., North East, Pa.
Burnside Steel Foundry Co., 1300 E. 92nd St., Chicago.
Burnwell Corp., 1113 N. 20th St., Allentown, Pa.
Burt Mfg. Co., 301 Main St., Akron 11, O.
Bush Mfg. Co., 100 Wellington St., Hartford 6, Conn.
Butler Street Fdry. & Iron Co., 3422 Normal Ave., Chicago.
Byers Co., A. M., Clark Bldg., Pittsburgh 22.

C

C-B Tool Co., Wabank Road, Lancaster, Pa.
C. & H. Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9.
Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia, 25.
Caldwell Co., Inc., W. E., 200 E. Brandeis, Louisville 8, Ky.
California Wire Cloth Corp., 1001 22nd Ave., Oakland, Calif.
Callahan Can Machine Co., Inc., 80 Richards St., Brooklyn.
Caloroil Burner Corp., 1477 Park St., Hartford 6, Conn.
Campbell, Andrew C., Division of American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn.
Campbell Engineering Co., 123 E. Pacific St., Appleton, Wis.
Campbell Htg. Co., E. K., 2445 Charlotte St., Kansas City 8, Mo.
Campbell Heating Co., P. O. Box 833, Des Moines 4, Ia.
Campbell Machine Co., 2845 Harriet Ave., Minneapolis.
Canatsey Electric Mfg. Co., 620 Wyandotte, Kansas City, Mo.
Canton Steel Ceiling Co., 194 Ninth Ave., New York City.
Canton Stoker Corp., 507 Andrews Pl., S. W., Canton 1, O.
Canvas Products Co., 1236 S. 7th St., St. Louis 4.
Capps, Joseph, Inc., 3200 Ardmore St., South Gate, Calif.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York City 17.
Carboloy Company, Inc., 11177 E. Eight Mile Rd., Detroit 32.
Carey Co., Philip, Lockwood, Cincinnati 15, O.
Cargoaire Engineering Corp., 75 West St., New York, N. Y.
Carlin Co., Anthony, 2717 E. 75th St., Cleveland.
• Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 30.
Carney Rockwool Co., Mankato, Minn.
Carolina Aniline & Extract Co., Inc., P. O. Box 2386, Charlotte, N. C.
Carpenter Heating & Stoker Co., 199 E. 55th St., Cleveland 3.
Carpenter & Paterson, Inc., 1190 Bennington St., East Boston, Mass.
Carrier Corp., 302 S. Geddes St., Syracuse 1, N. Y.
Carter Paint Co., 310 N. Main St., Liberty, Ind.
Carter Products Corp., 6921 Carnegie Ave., Cleveland 3.
Cartier & Sons Co., M. N., 275 Canal St., Providence 3, R. I.
Carty & Moore Eng. Co., 511 W. Larned St., Detroit.
Cary Mfg. Co., Waupaca, Wis.
• Catskill Metal Works, Inc., Catskill, N. Y.
Celotex Corp., 120 S. LaSalle St., Chicago 3.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago.
Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis 8.
Central Rubber & Steel Corporation, Findlay, Ohio.
• Central-West Machinery Co., 335 S. Western Ave., Chicago 12.
Centri-Spray Co., 14290 Meyers Rd., Detroit 27.
• Century Electric Co., 1806 Pine St., St. Louis 3.
• Century Engineering Corp., 401-431 Third St., S. E., Cedar Rapids, Ia.
Century Fan & Vent. Co., 103 E. 125th St., New York City.
Certain-teed Products Corp., 100 E. 42nd St., New York City.
Certified Flexible Couplings, 369 Lexington Ave., New York City 17.
Chace Co., W. M., 1606 Beard Ave., Detroit 9.
Chain Belt Co., 1618 W. Bruce St., Milwaukee 4.
Chalmers Oil Burner Co., 318 First Ave., N., Minneapolis.
Chamberlin Company of America, 1254 La Brosse, Detroit 26.
Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 211-215 Eaton St., Peoria 3, Ill.
• Champion Products Co., 218 Montgomery Bldg., Muskegon, Mich.
• Champion Tool Co., 376 W. 41st Pl., Los Angeles 37.
Chandler Co., 804 1st Ave., N. W., Cedar Rapids, Ia.
• Char-Gale Mfg. Co., 3127 Hiawatha Ave., Minneapolis 6.
Chase Brass & Copper Co., Incorporated, 236 Grand St., Waterbury 91, Conn.
Cheesman-Elliot Co., Inc., 639 Kent Ave., Brooklyn 11.
Chelsea Fan & Blower Co., Inc., 1206 S. Grove St., Irvington 11, N. J.
Chelsea Products, Inc., 1206 S. Grove St., Irvington 11, N. J.
• Cheney Metal Products Co., 623 Prospect St., Trenton 5, N. J.
• Cherry Rivet Co., 231 Winston St., Los Angeles 13.
Chester Mfg. Co., 1420 Thomas St., Lisbon, Ohio.
Chicago Automatic Stoker Co., Inc., 14 N. Clinton St., Chicago 6.
Chicago Belting Co., 113 N. Green St., Chicago 7.
Chicago Die Casting Co., 2520 W. Monroe St., Chicago 12.
Chicago Expansion Bolt Co., 2240 W. Ogden Ave., Chicago 12.
Chicago Filter Co., P. O. Box 807, Joliet, Ill.
Chicago Fire Brick Co., 1467 N. Elston Ave., Chicago.
Chicago Furnace Supply Co., 1278 Clybourn Ave., Chicago 10.
Chicago Heights Furnace Supply Co., 102 E. 22nd St., Chicago Heights, Ill.
Chicago Metal Hose Corp., 1315 S. Third Ave., Maywood, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32.
Chicago Perforating Co., 2445 W. 24th Pl., Chicago.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
• Chicago Precision Equipment Co., 919 N. Michigan Ave., Chicago 11.
Chicago Pump Co., 2330 Wolfram St., Chicago 18.
Chicago Rawhide Mfg. Co., 1312 Elston Ave., Chicago.
Chicago Rivet & Mach. Co., 9600 W. Jackson blvd., Bellwood, Ill.
Chicago Steel Foundry Co., Kedzie & 37th St., Chicago.
Chicago Steel Furnace Co., 9326 S. Anthony Ave., Chicago 17.
Chicago Steel & Wire Co., 103rd & Torrence Ave., Chicago 17.
Chicago Tramrail Co., 2910 W. Carroll St., Chicago 12.
Chisholm-Moore Hoist Corp., Div. Columbus McKinnon Chain Corp., 5000 Fremont Ave., Tonawanda, N. Y.
Choate Mfg. Co., 3464 Principio Ave., Cincinnati.
Cincinnati Elec. Tool Co., 2684 Madison Rd., Cincinnati 8.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati 25.
Cincinnati Sheet Metal & Roofing Co., 230 E. Front St., Cincinnati.
Cincinnati Stamping Co., 28-34 W. McMicken Ave., Cincinnati 10.
Circo Tool Company, 902 W. Vliet St., Milwaukee 5, Wis.
Circulators & Devices Mfg. Corp., 22 Rose St., New York 7.
• Clarage Fan Co., North & Porter Sts., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Co., Henry N., 56-62 Union St., Boston 8.
Clark Controller Co., 1146 E. 152 St., Cleveland 10.
Clark Dust Control Co., 210 N. Mozart St., Chicago.

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American Metal Weather Strip Co., 114 N. Division Ave., Grand Rapids 2, Mich.
American Moistening Co., 260 W. Exchange St., Providence 1, R. I.
• American Monorail Co., 13112 Athens Ave., Cleveland 7.
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April Showers Co., 4136 Eighth St., N. W., Washington 11.
Aqua-Mist Co., 426 Jefferson St., Topeka, Kan.
Aqua-Sorb Co., 21 S. 16th St., East Orange, N. J.
Arcos Corp., 1515 Locust St., Philadelphia 2.
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Arex Co., 333 N. Michigan Ave., Chicago.
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Arrow-Hart & Hegeman Elect. Co., 103 Hawthorne St., Hartford 6, Conn.
Associated Heater Parts Co., 2807 S. La Salle St., Chicago 16.
Associated Southern Industries, 1161 Union Ave., Memphis, Tenn.
Atcheson Glass Co., T. J., 955 Main St., Buffalo, N. Y.
Atchison Specialty Mfg. Co., 1620 Pacific Ave., Atchison, Kan.
Atkins & Co., E. C., 402 S. Illinois St., Indianapolis 9, Ind.
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Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.
Atlas Bolt & Screw Co., 1130 Ivanhoe Rd., N. E., Cleveland 10.
Atlas Machine & Tool Co., 115 N. Going St., Portland 11, Ore.
Atlas Tack Corporation, Box 31, Fairhaven, Mass.
Atlas Valve Co., 282 South St., Newark, N. J.
Atlas Welding Accessories Co., 14820 Wyoming Ave., Detroit 21.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Lock Box 471, Auburn, Ind.
Audubon Wire Cloth Corp., Allen St. & Castor Ave., Philadelphia.
• Auer Register Co., 3608 Payne Ave., Cleveland 14.
Au-Temp-Co Corp., 521 Fifth Ave., New York City 17.
Autoforce Ventilating System, 244 Washington St., Boston 8.
Autogas Co., 2258 Diversey Ave., Chicago 47.
Auto-Heat Corp., 311 W. 66th St., New York City.
Automatic Burner Corp., 1823 Carroll Ave., Chicago 12, Ill.
Automatic Gasflux Mfg. Co., 198 Wayne St., Mansfield, O.
• Automatic Humidifier Co., 19th & Main Sts., Cedar Falls, Ia.
• Automatic Products Co., 2450 N. 32nd St., Milwaukee 10, Wis.
Automatic Pump & Softener Corp., Rockford, Ill.
Automatic Switch Co., 41 E. 11th St., New York City 3.
Automatic Temperature Control Co., Inc., 44 E. Logan St., Philadelphia 44.
Avery Farm Machinery Co., 2006 S. Washington St., Peoria 2, Ill.

B

B/W Controller Corp., 2200 E. Maple Ave., Birmingham, Mich.
Babbitt Chemical Specialties Co., 630 Fifth Ave., New York 20.
Babcock & Wilcox Co., 85 Liberty St., New York 6.
Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh 8, Pa.
Bache & Co., Semon, Greenwich & Morton Sts., New York 14.
• Badger Corporation, 327 E. Brown St., Milwaukee 12, Wis.
Badger Mfg. Co., 106 N. Frances St., Madison, Wis.
Baer Brothers, 438 W. 37th St., New York City 18.
Bahnson Co., 1001 S. Marshall St., Winston-Salem, N. C.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Furnace & Cleaner Mfg. Co., 2152 Smead Ave., Toledo, O.
Baker Ice Machine Co., Inc., 1509 Evans St., Omaha, Nebr.
Baldor Electric Co., 4358 Duncan Ave., St. Louis 10, Mo.
Baldwin Belting, Inc., 85 Chambers St., New York 7.
Baldwin-Hill Co., 597 Klagg Ave., Trenton 2, N. J.
Ballantyne Co., 1707-11 Davenport St., Omaha 2, Nebr.
Balloffet Dies & Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Baltimore Enamel and Novelty Co., P. O. Box 928, Baltimore 3, Md.
Banner Repair Parts Co., 103 E. Indianola Ave., Youngstown 7, O.
Bantam Bearings Div., Torrington Co., South Bend 21, Ind.
Barber Co., Inc., 1600 Arch St., Philadelphia.
Barber-Colman Co., River & Loomis Sts., Rockford, Ill.
• Barber Gas Burner Co., 3704 Superior Ave., Cleveland 14.
Barclay, Inc., Robt., 128 N. Peoria St., Chicago 7.
Bardco Mfg. & Sales Co., 2450 E. 23rd St., Los Angeles, Calif.
Bard Mfg. Co., Evansport Road, Bryan, O.
Bardes Range & Foundry Co., E. H., 2619 Colerain Ave., Cincinnati, O.
Bargar Sheet Metal Co., 12401 Euclid, Cleveland.
Barland Weatherstrip Material Co., 1960 E. 59th St., Cleveland 3, O.
Barnard Co., Geo. A., 74 Prescott St., Worcester, Mass.
• Barnes, Inc., H. C., 330 E. 4th St., Long Beach 2, Calif.
Barnes Metal Products Co., 4425 W. 16th St., Chicago 23.
Barnes, W. O., 1297 Terminal Ave., Detroit 14.
Barrett Division, Allied Chemical & Die Corp., 40 Rector St. New York City 6.
Barrett Engineers, 1322 Warrensville Center Rd., Cleveland Heights 21, O.
Barry Furnace Co., 208 N. B St., Hamilton, O.
• Barth Manufacturing Co., Milldale, Conn.
Bartlett Hayward Co., 200 Scott St., Baltimore 3.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2.
Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago 30.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bath Co., Cyril, E. 70th & Machinery Ave., Cleveland 8.
Bayer Co., A. J., Slauson & Santa Fe Aves., Los Angeles.
• Bayley Blower Co., 1817 S. 66th St., Milwaukee 14.
Bayonne Steel Products Co., Clinton & Jeliff Aves., Newark 8, N. J.
Beacon-Morris Corp., 110-114 Brookline Ave., Boston 15.
Bead Chain Mfg. Co., 105 Mountain Grove St., Bridgeport 5, Conn.
Bear Mfg. Co., Industrial Div., 2030 Fifth Ave., Rock Island, Ill.
Bearing Co. of America, 501 Harrisburg Ave., Lancaster, Pa.
Beatrice Steel Tank Mfg. Co., 700 S. 7th St., Beatrice, Nebr.
Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind.
Beck Engineering Combustion Kompany, 2100 Cole St., St. Louis 6.
Beckett Engineering Co., R. W., W. River St., Elyria, O.
Beckett & Co., Thomas, 2118 Griffin St., Dallas 2, Texas.
Beckley Perforating Co., 305 North Ave., Garwood, N. J.
Belanger Fan & Blower Co., 1230 18th St., Detroit 16.
Belco Exhaust Fan Mfg. Co., 3830-32 Olive St., St. Louis 8.
Belden Machine Co., 1108 Whalley Ave., New Haven 15, Conn.
Belfield Co., H., 435 N. Broad st., Philadelphia 23.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Belmont Smelting & Refining Works, Inc., 281 Georgia Ave., Brooklyn 7, N. Y.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.
• Berger Bros. Co., 229-237 Arch St., Philadelphia 6.
Berger Mfg. Div. of Republic Steel Corp., 1038 Belden Ave., N. E., Canton 5, O.
Bergman Tool Mfg. Co., 1573-75 Niagara St., Buffalo 13, N. Y.
Bergstrom Mfg. Corp., Neenah, Wis.
Bern's Specialty Mfg. Co., 2278 Elston Ave., Chicago 14.
Bernz Co., Otto, 280 Lyell Ave., Rochester 6, N. Y.
Berridge Shear Company, Jefferson & St. Joseph Sts., Sturgis, Mich.
Bersted Co., Martin, 341 N. Crawford Ave., Chicago.
Bertram Mfg. Co., 230 E. Ohio St., Chicago.
Bertsch & Co., Church St., Cambridge City, Ind.
Best Register Co., 2005 W. Oklahoma Ave., Milwaukee 7.
Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.
• Bethlehem Steel Co., Bethlehem, Pa.
Betz Corp., 460 State St., Hammond, Ind.
• Beverly Shear Co., 3009 W. 110th Pl., Chicago 43.
Bieler & Son, L., 35-42 41st St., Long Island City 1, N. Y.
Bien Air Conditioning Company, Bell, Calif.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Biggs Supply Co., B. C., Lincoln, Nebr.
Binks Mfg. Co., 3114 Carroll Ave., Chicago 12.
Bird Archer Co., 4337 N. America St., Philadelphia.
Bird & Son, inc., East Walpole, Mass.

• Advertisement in this issue. See Index to Advertisers, pages 347-348.

Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14.
• Black & Decker Mfg. Co., 782 Pennsylvania Ave., Towson 4, Md.
Black Manufacturing Co., 1426 W. Baltimore St., Baltimore 23, Md.
Black Servant Stoker Co., 6504 Olive Blvd., St. Louis 5.
Blake & Johnson Co., Waterville, Conn.
Blake Manufacturing Co., 1600 Mill St., Rock Island, Ill.
Bliss Co., E. W., 1420 Hastings St., Toledo, O.
Blockson & Co., E. Fifth St., Michigan City, Ind.
Blood Brothers Machine Co., Div. Standard Steel Spring Co., Allegan, Mich.
Blower Application Co., 918 N. 4th St., Milwaukee 3.
Blue Ridge Talc Co., Inc., Henry, Va.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12.
Bogue Electric Co., 37 Kentucky Ave., Paterson 3, N. J.
Bohn Aluminum & Brass, Michigan Ave. & Shelby St., Detroit.
Bollaert, M., 4726 E. 12th St., Oakland 1, Calif.
Borm Manufacturing Co., Elgin, Ill.
Bossert Co., Inc., 1002 Oswego St., Utica, N. Y.
Boston Gear Wks., Inc., North Quincy 71, Mass.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47.
Bovee Furnace Works, 180 W. Eighth St., Waterloo, Ia.
Boyd & Co., Inc., Chas. P., 250-252 N. Third St., Philadelphia.
Braden Mfg. Co., 431 N. 14th St., Terre Haute, Ind.
Brasco Mfg. Co., 152nd & Commercial Ave., Harvey, Ill.
• Brauer Supply Co., A. G., 2100 Washington Ave., St. Louis 3.
Breidert, G. C., Co., 634 S. Spring St., Los Angeles 14.
• Bremil Mfg. Co., Box 1030, Erie, Pa.
• Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40.
Bridesburg Foundry Co., Tacony & Duncan Sts., Philadelphia.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport 1, Conn.
Bridgeport Screw Co., Bridgeport, Conn.
Briggs Clarifier Co., Ceramics Sales Div., Bethesda 14, Md.
Briggs Mfg. Co., 11631 Mack Ave., Detroit.
Brigham Oil Burner Co., 3745 Forest Park Blvd., St. Louis.
Bristol Co., P. O. Box 1790, Waterbury 91, Conn.
Brooklyn Metal Ceiling Co., 283-89 Greene Ave., Brooklyn, N. Y.
Brooks Co., Inc., B. D., 361 Atlantic Ave., Boston 10.
Bros Boiler & Mfg. Co., Wm., 1057 Tenth Ave., S. E., Minneapolis 14.
Brown-Appton Co., 681 Fifth Ave., New York City.
Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton, O.
Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., 4443 Wayne Ave., Philadelphia 44.
Brown Steel Tank Co., 2901 S. E. Fourth St., Minneapolis.
Brownell Co., 300 N. Findlay St., Dayton 1, O.
Brownie Stoker Co., 840 N. Morgan St., Decatur, Ill.
Browning Mfg. Co., Inc., Central Ave., Main & Chester Sts., Maysville, Ky.
Brumme Mfg. Co., 1220 E. Empire St., Bloomington, Ill.
• Brundage Co., 500 N. Park St., Kalamazoo 11, Mich.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
• Bruno Tools, 9330 Santa Monica Blvd., Beverly Hills, Calif.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant Corp., C. L., 4610 St. Clair Ave., Cleveland 3.
Bryant Heater Co., Dresser Industries, 17825 St. Clair Ave Cleveland 10.
Buckeye Products Co., 7024 Vine St., Cincinnati 16, O.
Buckeye Tools Corporation, 29 W. Apple St., Dayton 1, Ohio.
Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.
Buffalo Turbine Corp., 2165 Bailey Ave., Buffalo 11.
Buffalo Pumps, Inc., 171 Mortimer St., Buffalo, N. Y.
Buffalo Wire Works Co., 454 Terrace, Buffalo 3.
Burdett Mfg. Co., 19 N. Sheldon St., Chicago.
• Burden Company, 1151 S. Broadway, Los Angeles 15.
Burgess-Norton Mfg. Co., 773 Peyton St., Geneva, Ill.
Burgess Soldering Furnace Co., 292 E. Long St., Columbus 15, O.
Burke Electric Co., 1201 W. 12th St., Erie, Pa.
Burke Stoker & Mfg. Co., 921 W. 19th St., Chicago.
Burnham Stoker Co., 505 Columbia St., Vancouver, Wash.
Burnley Battery & Mfg. Co., Clay St., North East, Pa.
Burnside Steel Foundry Co., 1300 E. 92nd St., Chicago.
Burnwell Corp., 1113 N. 20th St., Allentown, Pa.
Burt Mfg. Co., 301 Main St., Akron 11, O.
Bush Mfg. Co., 100 Wellington St., Hartford 6, Conn.
Butler Street Fdry. & Iron Co., 3422 Normal Ave., Chicago.
Byers Co., A. M., Clark Bldg., Pittsburgh 22.

C

C-B Tool Co., Wabank Road, Lancaster, Pa.
C. & H. Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9.
Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia, 25.
Caldwell Co., Inc., W. E., 200 E. Brandeis, Louisville 8, Ky.
California Wire Cloth Corp., 1001 22nd Ave., Oakland, Calif.
Callahan Can Machine Co., Inc., 80 Richards St., Brooklyn.
Caloroil Burner Corp., 1477 Park St., Hartford 6, Conn.
Campbell, Andrew C., Division of American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn.
Campbell Engineering Co., 123 E. Pacific St., Appleton, Wis.
Campbell Htg. Co., E. K., 2445 Charlotte St., Kansas City 8, Mo.
Campbell Heating Co., P. O. Box 833, Des Moines 4, Ia.
Campbell Machine Co., 2845 Harriet Ave., Minneapolis.
Canatsey Electric Mfg. Co., 620 Wyandotte, Kansas City, Mo.
Canton Steel Ceiling Co., 194 Ninth Ave., New York City.
Canton Stoker Corp., 507 Andrews Pl., S. W., Canton 1, O.
Canvas Products Co., 1236 S. 7th St., St. Louis 4.
Capps, Joseph, Inc., 3200 Ardmore St., South Gate, Calif.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York City 17.
Carboloy Company, Inc., 11177 E. Eight Mile Rd., Detroit 32.
Carey Co., Philip, Lockwood, Cincinnati 15, O.
Cargoaire Engineering Corp., 75 West St., New York, N. Y.
Carlin Co., Anthony, 2717 E. 75th St., Cleveland.
• Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 30.
Carney Rockwool Co., Mankato, Minn.
Carolina Aniline & Extract Co., Inc., P. O. Box 2386, Charlotte, N. C.
Carpenter Heating & Stoker Co., 199 E. 55th St., Cleveland 3.
Carpenter & Paterson, Inc., 1190 Bennington St., East Boston, Mass.
Carrier Corp., 302 S. Geddes St., Syracuse 1, N. Y.
Carter Paint Co., 310 N. Main St., Liberty, Ind.
Carter Products Corp., 6921 Carnegie Ave., Cleveland 3.
Cartier & Sons Co., M. N., 275 Canal St., Providence 3, R. I.
Carty & Moore Eng. Co., 511 W. Larned St., Detroit.
Cary Mfg. Co., Waupaca, Wis.
• Catskill Metal Works, Inc., Catskill, N. Y.
Celotex Corp., 120 S. LaSalle St., Chicago 3.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago.
Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis 8.
Central Rubber & Steel Corporation, Findlay, Ohio.
• Central-West Machinery Co., 335 S. Western Ave., Chicago 12.
Centri-Spray Co., 14290 Meyers Rd., Detroit 27.
• Century Electric Co., 1806 Pine St., St. Louis 3.
• Century Engineering Corp., 401-431 Third St., S. E., Cedar Rapids, Ia.
Century Fan & Vent. Co., 103 E. 125th St., New York City.
Certain-teed Products Corp., 100 E. 42nd St., New York City.
Certified Flexible Couplings, 369 Lexington Ave., New York City 17.
Chace Co., W. M., 1606 Beard Ave., Detroit 9.
Chain Belt Co., 1618 W. Bruce St., Milwaukee 4.
Chalmers Oil Burner Co., 318 First Ave., N., Minneapolis.
Chamberlin Company of America, 1254 La Brosse, Detroit 26.
Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 211-215 Eaton St., Peoria 3, Ill.
• Champion Products Co., 218 Montgomery Bldg., Muskegon, Mich.
• Champion Tool Co., 376 W. 41st Pl., Los Angeles 37.
Chandler Co., 804 1st Ave., N. W., Cedar Rapids, Ia.
• Char-Gale Mfg. Co., 3127 Hiawatha Ave., Minneapolis 6.
Chase Brass & Copper Co., Incorporated, 236 Grand St., Waterbury 91, Conn.
Cheesman-Elliot Co., Inc., 639 Kent Ave., Brooklyn 11.
Chelsea Fan & Blower Co., Inc., 1206 S. Grove St., Irvington 11, N. J.
Chelsea Products, Inc., 1206 S. Grove St., Irvington 11, N. J.
• Cheney Metal Products Co., 623 Prospect St., Trenton 5, N. J.
• Cherry Rivet Co., 231 Winston St., Los Angeles 13.
Chester Mfg. Co., 1420 Thomas St., Lisbon, Ohio.
Chicago Automatic Stoker Co., Inc., 14 N. Clinton St., Chicago 6.
Chicago Belting Co., 113 N. Green St., Chicago 7.
Chicago Die Casting Co., 2520 W. Monroe St., Chicago 12.
Chicago Expansion Bolt Co., 2240 W. Ogden Ave., Chicago 12.
Chicago Filter Co., P. O. Box 807, Joliet, Ill.
Chicago Fire Brick Co., 1467 N. Elston Ave., Chicago.
Chicago Furnace Supply Co., 1278 Clybourn Ave., Chicago 10.
Chicago Heights Furnace Supply Co., 102 E. 22nd St., Chicago Heights, Ill.
Chicago Metal Hose Corp., 1315 S. Third Ave., Maywood, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32.
Chicago Perforating Co., 2445 W. 24th Pl., Chicago.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
• Chicago Precision Equipment Co., 919 N. Michigan Ave., Chicago 11.
Chicago Pump Co., 2330 Wolfram St., Chicago 18.
Chicago Rawhide Mfg. Co., 1312 Elston Ave., Chicago.
Chicago Rivet & Mach. Co., 9600 W. Jackson blvd., Bellwood, Ill.
Chicago Steel Foundry Co., Kedzie & 37th St., Chicago.
Chicago Steel Furnace Co., 9326 S. Anthony Ave., Chicago 17.
Chicago Steel & Wire Co., 103rd & Torrence Ave., Chicago 17.
Chicago Tramrail Co., 2910 W. Carroll St., Chicago 12.
Chisholm-Moore Hoist Corp., Div. Columbus McKinnon Chain Corp., 5000 Fremont Ave., Tonawanda, N. Y.
Choate Mfg. Co., 3464 Principio Ave., Cincinnati.
Cincinnati Elec. Tool Co., 2684 Madison Rd., Cincinnati 8.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati 25.
Cincinnati Sheet Metal & Roofing Co., 230 E. Front St., Cincinnati.
Cincinnati Stamping Co., 28-34 W. McMicken Ave., Cincinnati 10.
Circo Tool Company, 902 W. Vliet St., Milwaukee 5, Wis.
Circulators & Devices Mfg. Corp., 22 Rose St., New York 7.
• Clarage Fan Co., North & Porter Sts., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Co., Henry N., 56-62 Union St., Boston 8.
Clark Controller Co., 1146 E. 152 St., Cleveland 10.
Clark Dust Control Co., 210 N. Mozart St., Chicago.

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Clark Jr., Electric Co., Jas., 600 E. Bergman St., Louisville 3, Ky.
Clark Stek-O Corp., 1631 Dewey Ave., Rochester 13, N. Y.
Clauss Shear Co., Fremont, O.
Clay Equipment Corp., Cedar Falls, Ia.
Clayton & Lambert Mfg. Co., 14247 Tireman Ave., Dearborn, Mich.
Clayton & Lambert Mfg. Co., Louisville Div., 1707 Dixie Hwy., Louisville 10, Ky.
• Clayton & Lambert Mfg. Co., Middletown Div., Middletown, O.
Clearing Machine Corp., 6499 W. 65th St., Chicago 38.
Clendenin Brothers, Inc., 108 South St., Baltimore 2, Md.
Clements Mfg. Co., 6650 S. Narragansett Ave., Chicago.
Clemson Bros., Inc., Middletown, N. Y.
Cleveland Heater Co., 2310 Superior Ave., N. E., Cleveland 14.
• Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3.
Cleveland Punch & Shear Works Co., E. 40th & St. Clair Ave., Cleveland 14.
Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland 5.
• Cleveland Steel Products Corp., Torridheet Div., Madison Ave. at W. 74th St., Cleveland 2.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., 1101 E. 283rd St., Wickliffe, Ohio.
Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.
Clisbe Bros. Mfg. Co., P. O. Box 31, Plymouth, Ind.
Clough, A. W., 28 S. Broad St., Meriden, Conn.
Coal-O-Matic Stoker Co., Trucksville, Pa.
Coast Insulating Corp., 634 S. Western Ave., Los Angeles.
Coast Pneumatic Tool Co., 6516 Selma Ave., Los Angeles 28.
Cocking, Geo. J., 1336 W. 5th St., Santa Ana, Calif.
Coddington Mfg. Co., E. D., 5024 N. 37th St., Milwaukee.
Colebrook & Sons, Inc., W. H., 246 Walton St., Syracuse, N. Y.
Cole Hot Blast Mfg. Co., 3103 W. 51st St., Chicago 32.
• Cole-Sullivan Engineering Co., 1316 3rd St., N., Minneapolis 11.
Coleman Co., Inc., St. Francis & Second St., Wichita 1, Kans.
Columbia Burner Co., 729 Ewing St., Toledo, O.
• Columbia Steel Co. (Sub. United States Steel Corp.), Russ Bldg. 235 Montgomery St., San Francisco 6.
Columbus Heating & Ven. Co., 182 N. Yale Ave., Columbus 16, Ohio.
Comfort Products Corp., 7 W. 147th St., Harvey, Ill.
Commercial Filters Corporation, 18 W. Third St., Boston 27.
Commercial Plastics Co., 201 N. Wells St., Chicago 6.
Commercial Shearing & Stamping Co., P. O. Box 719, Youngstown 1, Ohio.
Commonwealth Brass Corp., 5781-5835 Commonwealth Ave., Detroit 8.
Commonwealth Products Co., 1303 Real Estate Tr. Bldg., Philadelphia 7.
Compton Shear Co., W. H., 314 Camden St., Newark 3, N. J.
• Conco Engineering Wks., Div. H. D. Conkey & Co., Mendota, Ill
• Condensation Engineering Corp., 122 S. Michigan Ave., Chicago 3.
Conditionaire Unit Co., 2821 Montrose Ave., Chicago 18.
Congress Die Casting Div., Congress Tool & Die Co., 3750 East Outer Drive, Detroit 12.
Conklin Brass & Copper Co., Inc., T. E., 54-60 Lafayette St., New York City.
Connery Construction Co., 3900 N. 2nd St., Philadelphia 40.
• Connor Eng. Corp., W. B., 114 E. 32nd St., New York City 16.
Connors Paint Mfg. Co., Wm., 669-683 River St., Troy, N. Y.
Consolidated Car-Heating Co., Inc., Albany, N. Y.
Consolidated Industries, Inc., 14 N. Sixth St., Lafayette, Ind.
Consolidated Steel Corp., Ltd., P. O. Box 1348, Arcade Station, Los Angeles, Calif.
Continental Diamond Fibre Co., Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark 5, N. J.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Rubber Works, 1900 Liberty Pkwy., Erie, Pa.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Continental Water Heater Co., Ltd., 1801 Pasadena Ave., Los Angeles 31.
Controlair Manufacturing Company, 1932 S. Compton St., Los Angeles.
Cook, Inc., A. D., P. O. Box 70, Lawrenceburg, Ind.
Cook Electric Co., 2700 Southport Ave., Chicago.
Cooper Co., Clark, Palmyra, N. J.
Cooper & Cooper, Inc., 37 Fenn St., Pittsfield, Mass.
Cooper Oven Thermometer Co., Pequabuck, Conn.
Copeland Refrigeration Corp., Sidney, O.
Cooper Roofs Corp., 5060 Plankinton Bldg., Milwaukee.
Copperweld Steel Co., Box 1000, Glassport, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Corbin Div., P & F, American Hardware Corp., 67 Park St., New Britain, Conn.
Corbin Screw Corp., 1944 High St., New Britain, Conn.
Corbman Bros., Inc., 315 N. 7th St., Philadelphia.
Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.
Cork Import Corp., 330 W. 42nd St., New York City 18.
Cork Insulation Co., Inc., 155 E. 44th St., New York City.
Cornell Iron Works, Inc., 36th Ave. & 13th St., Long Island City 1, N. Y.
Coroaire Heater Corp., 1422 Euclid Ave., Cleveland 15.
• Cotta Transmission Co., 2340 Eleventh St., Rockford, Ill.
Cox Roofing Co., 1014 North-West Blvd., Winston-Salem, N. C.
Cramer Co., Inc., The R. W., Centerbrook, Conn.
• Crandall Mfg. Co., 1512 W. Slauson, Los Angeles 44.
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crawford Co., 3220 W. 31st St., Chicago 23.
Crary Mfg. Co., 396 N. Second St., Middleport, O.
• Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
• Crise Electric Mfg. Co., 2040 E. Main St., Columbus 16, O.
Crocker-Wheeler Electric Mfg. Co., Ampere 1, N. J.
Cross Engineering Co., 160-178 Dundaff St., Carbondale, Pa.
Crowe Name Plate & Mfg. Co., 3701 Ravenswood Ave., Chicago.
Crown Controls Company, New Bremen, Ohio.
Crown Iron Works, 1229 Tyler St., N. E., Minneapolis 13.
Crucible Steel Co. of America, 405 Lexington Ave., New York 17.
Curtis Refrigerating Machine, Div. Curtis Mfg. Co., 1946 Kienlen Ave., St. Louis 20.
Cutler-Hammer, Inc., N. 12th St. and W. St. Paul Ave., Milwaukee 1.
Cyclone Fence Div., American Steel & Wire Co., Waukegan, Ill.

D

Dahlquist Mfg. Co., Inc., 628 Somerville Ave., Somerville 43, Mass.
• Dahlstrom Machine Works, 5014 N. Kedzie Ave., Chicago 25.
Dahlstrom Metallic Door Co., S. E. Cor. E. Second & Buffalo Sts., Jamestown, N. Y.
Dallas Engineering Co., Inc., 2000 S. Akard, Dallas, Tex.
Dallman Supply Co., 6th & Q Sts., Sacramento 6, Calif.
Dalmo-Victor Co., 1414 El Camino Real, San Carlos, Calif.
Dalzen Tool & Mfg. Co., 12255 E. Eight Mile Rd., Detroit 5.
• Damascus Steel Products Corp., 2215 Kishwaukee St., Rockford, Ill.
Dampney Co. of America, 1243 River St., Hyde Park, Boston.
Daniels Mfg. Co., Inc., Sam, Daniels Rd., Hardwick, Vt.
Danville Stove & Mfg. Co., Beaver St., Danville, Pa.
Danzer Metal Works Co., Box 201, Hagerstown, Md.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
Davis & Co., Inc., Dean W., 549 W. Fulton St., Chicago 6.
Davis & Siehl Co., 4032 Hamilton Ave., N. S., Cincinnati 23, O.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8.
Davison Chemical Corp., Baltimore 3, Md.
Davy Fuel & Supply Co., Stoker Div., 14460 Dexter Blvd., Detroit.
Day Co., 810 Third Ave., N. E., Minneapolis 13.
Day & Night Manufacturing Co., P. O. Box 150, Monrovia, Calif.
Dayton Greenhouse Mfg. Co., P. O. Box 801, Dayton, O.
Dayton Pump & Mfg. Co., 500 N. Webster St., Dayton, O.
Dayton Rogers Mfg. Co., 2830 13th Ave., S., Minneapolis.
Dayton Rubber Mfg. Co., 2345 W. Riverview Ave., Dayton 1, O.
Debevoise Co., 968 Grand St., Brooklyn 6.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Iron & Steel Co., P. O. Box 72, Decatur, Ala.
Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
Defender Instrument and Regulator Co., 308 S. 8th St., St. Louis 2.
De Laval Steam Turbine Co., 300 Nottingham Way, Trenton 2,
• Delavan Engineering Co., 414 12th St., Des Moines 9, Ia.
Delco Appliance Div., General Motors Corp., 391 Lyell Ave., Rochester 1, N. Y.
Delco Products Division, General Motors Corp., 329 E. First St., Dayton, O.
D'Elia Oil Burner Co., Inc., 145 Stratford Ave., Bridgeport 3, Conn.
DeLuxe Furnace & Wall Heater Co., 4812 Western Ave., Los Angeles 37.
Deming Co., 148 Aetna St., Salem, O.
Demuth & Sons, Charles, 245 Elm Place, Mineola, L. I., N. Y.
Deniston Co., 4856 S. Western Ave., Chicago 9.
Densewood Corporation, Elkhorn, Wis.
Densmore-Quinlan Co., 910 74th St., Kenosha, Wis.
Denver Fire Clay Co., 2301 Blake St., Denver 17, Colo.
Deshler Foundry & Machine Wks., 140 S. East Ave., Deshler, O.
• Des Moines Stove Repair Co., 107 S. W. Second Ave., Des Moines 5, Ia.
Despatch Oven Co., 619 Southeast St., Minneapolis 14.
Detroit Air Conditioning Service Co., Inc., 1314 Holden Ave., Detroit 2.
• Detroit Air Filter Company, 1228 W. Kinzie St., Chicago 22, Ill.
Detroit Graphite Co., 550 Twelfth St., Detroit.
Detroit Hoist & Machine Co., Clay Ave. & GTRR, Detroit.
• Detroit Lubricator Co., 5900 Trumbull Ave., Detroit 8.
Detroit-Michigan Stove Co., 6900 E. Jefferson Ave., Detroit.
Detroit Moulding Div., L. A. Young Spring & Wire Corporation, 9210 Russell St., Detroit 11.
Detroit Safety Furnace Pipe Co., 5960 Second Blvd., Detroit.
Detroit Stamping Co., 350 Midland Ave., Detroit 3.
Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit 11.
Detroit Stoker Co., General Motors Bldg., Detroit 2. (Sales & Engineering); Monroe, Mich. (Main Office & Works).
Detroit Surfacing Machine Co., 7433 W. Davison St., Detroit.
Detroit Torch & Mfg. Co., 12057 Cardoni Ave., Detroit.
De Vilbiss Co., 300 Phillips Ave., Toledo 1, O.
Devoe & Raynolds Co., Inc., 44th St. & 1st Ave., New York City 17.
Diamond Castings Co., Terra Cotta Rd., Johnsonburg, Pa.
Diamond Chain & Mfg. Co., 400 Kentucky Ave., Indianapolis 7.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.

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Diamond Iron Works, Inc., 1728 Second St., N., Minneapolis 11.
Diamond Manufacturing Co., 243 W. 8th St., Wyoming, Pa.
Diceler Corp., Gasport, N. Y.
Dick Co., Inc., R. & J., 24-48 Sade St., Passaic, N. J.
Dickey-Grabler Co., 10298 Madison Ave., Cleveland.
Dickson Co., 7420 Woodlawn Ave., Chicago 19.
Dickson Coal Co., 30 Rockefeller Plaza, New York City.
Dickson Weatherproof Nail Co., P. O. Box 590, Evanston, Ill.
Dieckmann Co., Ferdinand, 1180 Harrison St., Cincinnati 22, O.
Diehl Mfg. Co., Finderne Plant, 1117 Finderne Ave., Somerville, N. J.
Diener Mfg. Co., Geo. W., 400 N. Monticello Ave., Chicago.
Disston & Sons, Inc., Henry, Unruh & Milner Sts., Tacony Sta., Philadelphia 35.
Doall Co., 254 Laurel Ave., Des Plaines, Ill.
DoAll Company, 1301 Washington Ave., South, Minneapolis 4.
Dockson Corp., 3839 Wabash Ave., Detroit 8.
Dodge Mfg. Co., 500 S. Union St., Mishawaka, Ind.
Doheny Co., John J., 326 Lake St., Belmont, Mass.
Dollinger Corp., 11 Centre Park, Rochester 3, N. Y.
Dornback Furnace & Fdry. Co., 724 E. 103rd St., Cleveland.
Dow Chemical Company, Midland, Mich.
• Dowagiac Steel Furnace Co., Beeson St., Dowagiac, Mich.
Downs-Smith Brass & Copper Co., Inc., 304-320 E. 45th St., New York 17.
• Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 7, Mich.
Dracco Corp., 4057 E. 116th St., Cleveland, O.
Dragert Co., C. H., Inc., 237 India St., Brooklyn.
Dravo Corp., Neville Island, Pittsburgh 25.
Drayer-Hanson, Inc., Box 2215, Terminal Annex, Los Angeles 54.
• Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36.
Drying Systems, Inc., 1800 W. Foster Ave., Chicago 40.
Dry-Zero Corp., 222 W. North Bank Drive, Chicago 54.
Dual-Air Fan Corp., 711 W. Lake St., Chicago.
• Dual-Heat Iron Company, 4370 Sunset Blvd., Los Angeles 27.
Dual Remote Control Co., Wayne, Mich.
Dunham Co., C. A., 450 E. Ohio St., Chicago, 11.
Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.
du Pont de Nemours & Co., E. I., Wilmington 98, Del.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Duraloy Co., Scottdale, Pa.
Duriron Co., Inc., 450 N. Findlay St., Dayton 1, O.
Duro Metal Products Co., 2649 N. Kildare Ave., Chicago.
Dusing & Hunt, Inc., 1927 Elmwood Ave., Buffalo 7, N. Y.
Dwyer Mfg. Co., F. W., 565 W. Washington St., Chicago 6.
Dynamic Air Engineering, Inc., 1619 S. Alameda St., Los Angeles 21.

E

Eagle-Picher Co., American Bldg., Central Pkwy. & Walnut, Cincinnati 1.
Eaglesfield Ventilator Co., 910-20 Dorman St., Indianapolis.
Earl Co., Warren, 3409 McKinney Ave., Houston, Tex.
Eastern Air Devices, Inc., 585 Dean St., Brooklyn 17.
Eastern Oil & Equipment Co., 27 Portland St., Portland 1, Me.
Eastern Stainless Steel Corporation, P. O. Box 1975, Baltimore 3, Md.
Eastern States Supply Co., 127 Troutman St., Brooklyn 6.
Eav-Tex Co., 307 Lincoln Ave., Upper Darby, Pa.
Eclipse Air Brush Co., Inc., 381 Park Ave., Newark, N. J.
Eclipse Fuel Engineering Co., 707 S. Main St., Rockford, Ill.
Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Economy Pumps, Inc., 1000 Weller Ave., Hamilton, O.
Eddy Stoker Corp., 4717 W. North Ave., Chicago 39.
Edison, Inc., Thomas A., Instrument Div., Lakeside Ave., West Orange, N. J.
Edwards Furnace Co., 25 East Ave., Wellsboro, Pa.
Edwards Mfg. Co., Inc., 337 Eggleston Ave., Cincinnati 2, O.
• Effecto Grille Co., 9930 Freeland, Detroit 27.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Elermann Floor Scraper Co., 102 E. Market St. (rear), York, Pa.
Elker Mfg. Co., Ogallala, Nebr.
Elmer & Amend, 635 Greenwich St., New York 14.
Eisler Engineering Co., 761 S. 13th St., Newark 3, N. J.
• Elaterite Non-Metallic Products Co., 355 S. Broadway, Los Angeles 13.
Elco Tool & Screw Corp., 1300 Broadway, Rockford, Ill.
Electric Arc, Inc., 152 Jeliff Ave., Newark 8, N. J.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland.
Electric Furnace Man, Inc., 4th & Furnace Sts., Emmaus, Pa.
Electric Machinery Mfg. Co., 1137 Tyler St., N. E. Minneapolis 13.
Electric Materials Co., Clay & Washington Sts., North East, Pa.
Electric Soldering Iron Co., Inc., W. Elm St., Deep River, Conn.
Electric Sprayit Co., 1415 Illinois Ave., Sheboygan, Wis.
Electric Vacuum Cleaner Co., Inc., 1734 Ivanhoe Rd., Cleveland 10.
Electric Valve Mfg. Co., Inc., 68 Murray St., New York City 7.
Electrimatic Div., The Simonis Co., 2100 Indiana Ave., Chicago 16.
Electroaire Corp., 1455 W. Congress St., Chicago 7.
Electro Lift, Inc., 32 Church St., New York City.
Electrol Manufacturing Co., 253 Chestnut St., Passaic, N. J.
Electroloy Company, Inc., 435 N. Michigan Ave., Chicago 11.
Electronic Products Co., Geneva, Ill.
Electrovent Corp., 5245 Western Ave., Detroit 10, Mich.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago.
• Elgo Shutter & Mfg. Co., 6970 W. Jefferson Ave., Detroit 17.
Ellison Draft Gage Co., 214 W. Kinzie St., Chicago 10.
Elsey Metal Specialties Co., 1535 Spruce St., Detroit, Mich.
Emerson Electric Mfg. Co., 1824 Washington Ave., St. Louis 3.
Empire Door Co., Inc., 431 Southern Blvd., New York 55, N. Y.
Empire Metal Co., 820 E. Water St., Syracuse, N. Y.
Empire Sheet & Tin Plate Co., N. Bowman St., Mansfield, O.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.
Engelhard, Inc., Chas., 90 Chestnut St., Newark, N. J.
Enterprise Foundry, Inc., 1123 E. "B" St., Belleville, Ill.
Equipment Sales Co., Inc., 306 13th St., Oakland 12, Calif.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 N. Lawrence St., Philadelphia 40.
Eselgroth & Co., 22 Edison Pl., Newark 2, N. J.
Ess Instrument Co., Fort Lee, N. J.
Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21.
Estate Stove Co., Hamilton, O.
Etched Products Co., 3901 Queens Blvd., Long Island City.
Euclid Crane & Hoist Co., 1375 Chardon Rd., Euclid 17, Ohio.
Eugene Excelsior Co., Eugene, Ore.
Eutectic Welding Alloys Co., 40 Worth St., New York City 13.
Evanoll Div., Evans Products Co., 15310 Fullerton Ave., Detroit 27.
Evercrete Corp., 19 W. 44th St., New York City.
Everhot Mfg. Co., 57 S. 19th Ave., Maywood, Ill.
Everite Pump & Mfg. Co., Inc., 617 N. Price St., Lancaster, Pa.
Everhot Products Co., Chicago 12.
• Excel Heating & Air Conditioning Co., 3715 Belmont Ave., Chicago 18.
Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago 6.
Excelsior Stove & Mfg. Co., 510 S. Front St., Quincy, Ill.
Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
Extended Surface, Inc., 58 Second Ave., Brooklyn, N. Y.
Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

F

Fafnir Bearing Co., 37 Booth St., New Britain, Conn.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5.
Fairfield Oil Heating Co., Inc., Mason St., Greenwich, Conn.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmount Tool & Forging Co., 10611 Quincy Ave., Cleveland 6.
Falstrom Co., Main Ave. & D. L. & W. R. R., Passaic, N. J.
• Famco Machine Company, 1314 Eighteenth St., Racine, Wis.
Fargo Foundry Co., 92 N. P. Ave., Fargo, N. D.
Farquhar Furnace Co., 150 Owens Ave., Wilmington, O.
Farr Co., 2615 Southwest Dr., Los Angeles 43.
Farrell-Cheek Steel Co., Stoker Parts Div., First & Lane Sts., Sandusky, O.
Farrelloy Co., Inc., 1243 N. 26th St., Philadelphia 21.
Farris Furnace Co., 920-930 Enos Ave., Springfield, Ill.
Faultless Heater Corp., 10217 St. Clair Ave., Cleveland.
FauceHot Heater Co., LaPorte, Ind.
Favorite Stove Co., 440 Webster St., Piqua, O.
Fedders Mfg. Co., Inc., 57 Tonawanda St., Buffalo 7.
Federal Machine & Welder Co., 212 Dana St., Warren, O.
Federal-Mogul Corp., 11031 Shoemaker St., Detroit 13.
Fee & Mason Mfg. Co., 81 Beekman St., New York City.
Fee & Stemwedel, Inc., 2210 Wabansia Ave., Chicago 47.
Felters Co., Inc., 210 South St., Boston 11.
Fenwal, Inc., 200 Pleasant St., Ashland, Mass.
Ferdon Equipment Engineering Co., 26 Evans Place, Hillside, N. J.
• Fern, Ralph, 2517 Boulevard Ave., Scranton 9, Pa.
Ferro Enamel Corp., Liquid Plastics Div., 4150 E. 56th St., Cleveland 5.
• Field Control Div., H. D. Conkey & Co., Drawer 111, Mendota, Ill.
Figge Mfg. Co., 189 W. Madison St., Chicago 12.
Fingles Co., The, Reisterstown Rd. at Elgin Ave., Baltimore 17.
Firecraft Corporation, 3319 Wallace St., Chicago 16.
Fire-King Stoker Company, 3760 E. St. Clair St., Indianapolis 1.
Fireline Stove & Furnace Lining Co., 1816 Kingsbury St., Chicago 14.
Firemood Machine Wks., Converse, Ind.
Firestone Tire & Rubber Co., Firestone Park, Akron, O.
Fir-Tex Insulating Board Co., St. Helens, Ore.
Fisher Governor Co., 203 S. First Ave., Marshalltown, Ia.
• Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York City 17.
Flemm Lead Co., Inc., Bradley Ave. & School St., Long Island City 1, N. Y.
Flintkote Co., 30 Rockefeller Plaza, New York 20.
Flood Co., 6217 Carnegie Ave., Cleveland.
Floral City Co., 402 S. Monroe St., Monroe, Mich.
Florence Stove Co., 205 School St., Gardner, Mass.
Floridin Co., Warren, Pa.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2.
Flynn Mfg. Co., Michael, N. W. Cor. Allegheny Ave. & Tulip St., Philadelphia 34.
• Follansbee Steel Corp., Third & Liberty Aves., Pittsburgh 30.
Folsom Snow Guard Co., 336 Union St., Millis, Mass.
Foote Foundry Co., J. B., N. Main St., Fredericktown, O.
Ford Chain Block Div., American Chain & Cable Co., Inc., Philadelphia.
Ford Roofing Products Co., 111 W. Washington St., Chicago.

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• Forest City Foundries Co., 2500 W. 27th St., Cleveland 13.
Forman Air Conditioning & Engineering Co., 345 W. 40th St., New York 18.
Fossum Mfg. Co., M. H., 1795 St. Clair Ave., St. Paul.
Fox Control & Mfg. Co., 3589 E. 93rd St., Cleveland.
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.
Foy Stoker Mfg. Co., 1419 Diversey, Chicago.
Franklin Gas Heating Co., Box 73, Station A, Cincinnati 25.
Fraser & Johnston Co., 725 Potrero Ave., San Francisco 10.
Frayn & Co., N. J., P. O. Box 1005, Redwood City, Calif.
Freed Heater & Stoker Co., Collegeville, Pa.
Freed Products Co., 1510 Third Ave., Moline, Ill.
Fresh'nd-Aire Co., 325 N. Wells St., Chicago 10.
• Frey & Co., Frank P., 2634 W. Madison St., Chicago.
Frick Co., W. Main St., Waynesboro, Pa.
Friedley-Voshart Co., 763 W. Lexington St., Chicago.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave. & Loch Raven Blvd., Towson, Baltimore 4.
Frigidaire Div., General Motors Corp., 300 Taylor St., Dayton 1, O.
• Front Rank Furnace Co., Div. Liberty Foundry Co., 2500 Ohio Ave., St. Louis 4.
Fuel Savers, Inc., 15th & Herr St., Harrisburg, Pa.
Fuller-Warren Co., 2506 N. 32nd St., Milwaukee.
Fulton Syphon Co., Box 400, Knoxville 4, Tenn.
• Furbio Co., Hermansville, Mich.

G

G. & O. Mfg. Co., 138 Winchester Ave., New Haven 8, Conn.
G. & S. Tool Co., 8790 Grinnell, Detroit.
G. M. Manufacturing Co., 50 W. Third St., New York City 12.
• Gallaher Co., Box 7, Owatonna, Minn.
Galva Heater Co., Galva, Ill.
Galv-Weld Products, P. O. Box 37, Sta. D, Dayton 10, Ohio.
Gammeter Co., W. F., Lincoln Ave. Extension, Cadiz, O.
Gar Wood Industries, Inc., 7924 Riopelle St., Detroit 11.
Garber Lumber & Construction Co., Strasburg, O.
Garden City Fan Co., 332 S. Michigan Blvd., Chicago 4.
Garden City Laboratory, Inc., 2744 W. 37th Pl., Chicago.
Gardiner Metal Co., 4820 S. Campbell Ave., Chicago 32.
Gascol Furnace Co., The, 3126 Preble Ave., Pittsburgh.
Gasoroll Mfg. Corp., Genoa City, Wis.
Gates Rubber Co. Sales Div., Inc., 999 S. Broadway, Denver 17, Colo.
Gaul Air Conditioner Co., 3116 N. Main St., Dayton 5, O.
• Gehl Bros. Mfg. Co., West Bend, Wis.
Gehri Co., 1117 Tacoma Ave., Tacoma 3, Wash.
General Blower Co., 8600 Ferris Ave., Morton Grove, Ill.
General Blower Co., Inc., 5335 Market St., Philadelphia 39.
• General Controls Co., 801 Allen Ave., Glendale 1, Calif.
General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.
• General Electric Co., Air Cond. Dept., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Plastics Div., 1 Plastics Ave., Pittsfield, Mass.
General Electric Co., Nela Park, Cleveland 12.
General Electric Co., 1 River Rd., Schenectady 5, N. Y.
General Equipment Co., 311-15-19 S. Wichita St., Wichita, Kan.
General Etching & Mfg. Co., 3076 W. Grand Ave., Chicago.
General Gas Light Co., 212 N. Park St., Kalamazoo 11F, Mich.
• General Heating Products Co., 3353 University Ave., Minneapolis.
General Insulating Products Co., 8821 15th Ave., Brooklyn.
General Machine Co., Inc., Fourth & Furnace Sts., Emmaus, Pa.
General Machinery Co., 3500 Riverside Ave., Spokane, Wash.
General Metal Products Co., 3883 Delor St., St. Louis 16.
General Motors Corp., Moraine Products Div., Dayton, O.
General Oil Heating Corp., 528 Jefferson St., West New York, N. J.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Refrigeration Div., Yates-American Machine Co., Shirland Ave., Beloit, Wis.
General Sales & Products Co., 242 Saratoga St., Cohoes, N. Y.
General Scientific Equipment Co., 1346 W. Somerset St., Philadelphia 32.
General Sheet Metal Works, Inc., Silliman Ave. & Ash St., Bridgeport, Conn.
General Wesco Stove Co., 621 N. Jefferson Ave., Springfield, Mo.
Geometric Stamping Co., 1111 E. 200th St., Cleveland 17.
Gerard Chemical Co., 87 Front St., Elizabeth, N. J.
• Gerett Corp., M. A., 722 W. Winnebago St., Milwaukee 5.
Gerhardt, W. F., 2007 W. Broad St., Richmond 20, Va.
Gerstein & Cooper Co., 1 W. Third St., South Boston 27, Mass.
Geuder, Paeschke & Frey Co., W. St. Paul Ave., and N. 15th St., Milwaukee.
Giant Mfg. Co., South Ave., Council Bluffs, Ia.
Gibraltar Engineering Co., 911 N. Orange Dr., Los Angeles.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert & Son, Harry E., 220 Brooklawn Terrace, Bridgeport, Conn.
Gillen Co., J. L., Dowagiac, Mich.
Gillian Mfg. Co., 7752 Dubois St., Detroit 11.
Gilmer Co., L. H., Div. United States Rubber Co., Cottman & Keystone Sts., Tacony, Philadelphia 35.
Gisholt Machine Co., 1253 E. Washington Ave., Madison 3, Wis.
Glasby Mfg. Co., Inc., J. P., Montgomery & Willett Sts., Belleville, N. J.
Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn 27, N. Y.
Glenn-Roberts Company, P. O. Box 12, Fruitvale Sta., Oakland 1, Calif., and 2107 Adams St., Indianapolis 1, Ind.
• Gleason-Avery, Inc., Auburn, N. Y.
Glidden Co., 11001 Madison Ave., Cleveland 2.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Globe Machinery & Supply Co., E. 1st & Court Ave., Des Moines 8, Ia.
Globe Roofing Products Co., Inc., 2207 Schrage Ave., Whiting, Ind.
Globe Stamping Div., Hupp Motor Car Corp., 1250 W. 76th St., Cleveland 2.
Goese Mfg. Co., 2548 N. 18th St., Milwaukee 6.
Goethel Sheet Metal Works, Alfred, 1912 N. Killian Pl., Milwaukee.
Goettl Bros., 714 S. Central Ave., Phoenix, Ariz.
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh.
Goldens' Foundry & Machine Co., P. O. Box 96, Columbus, Ga.
Gold Star Oil Burner Mfg. Co., 146 Warburton Ave., Yonkers, N. Y.
Goodrich Co., B. F., 500 S. Main St., Akron, O.
Goodyear Tire & Rubber Co., Inc., 1144 E. Market St., Akron 16, Ohio.
Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
Govornair Corp., 617 N. W. Second St., P. O. Box 1654, Oklahoma City, Okla.
Grabler Manufacturing Co., 6565 Broadway, Cleveland.
Grammes & Sons, Inc., L. F., 388 Union St., Allentown, Pa.
Grand Rapids Blow Pipe & Dust Arrester Co., 536 Monroe Ave., Grand Rapids 2, Mich.
• Grand Rapids Die & Tool Co., Div. Expert Die & Stamping Co., 203 Front Ave., N. W., Grand Rapids 4, Mich.
Grand Rapids Wire Products Co., 503 Front Ave., N. W., Grand Rapids 4, Mich.
Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
• Grant Wilson, Inc., 141 W. Jackson Blvd., Chicago 4.
Graton & Knight Company, 356 Franklin St., Worcester 4, Mass.
• Gray, G. L., 509 Grand Ave., New Haven 3, Conn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y.
Great Lakes Steel Corporation, Ecorse, Detroit.
Great National Air Conditioning Corp., 2125 N. Harwood St., Dallas 1, Tex.
Green Colonial Furnace Company, 322 S. W. Third St., Des Moines 7, Ia.
Green Fire Brick Co., A. P., Mexico, Mo.
Green Mfg. Co., 605 W. Washington St., Chicago.
Greenberg's Sons, M., 765 Folsom St., San Francisco 7.
Greene, Tweed & Co., 4377 Bronx Blvd., Bronx, N. Y.
Greenlee Tool Co., 2136 Twelfth St., Rockford, Ill.
Grinnell Co., Inc., 260 W. Exchange, Providence 1, R. I.
Griscom-Russell Co., The, 285 Madison Ave., New York City.
Griswold Mfg. Co., 1001-1065 W. 12th St., Erie, Pa.
Grob Brothers, Grafton, Wis.
Grobet File Corp. of America, 421 Canal St., New York City 13.
Grossenbacher Furnace Co., 9416 W. Milton Ave., St. Louis 14.
Guardian Electric Mfg. Co., 1400 Washington Blvd., Chicago 7.
Guardian Utilities Co., 215 E. Michigan St., Michigan City, Ind.
Guth Co., Edwin F., 2615 Washington Blvd., St. Louis 3.

H

H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia 32.
H P L Mfg. Co., 2015 E. 65th St., Cleveland.
Hague & Co., Inc., Alfred, 224 34th St., Brooklyn 32, N. Y.
Haines Gauge Company, Inc., 2301 W. Allegheny Ave., Philadelphia 32.
• Hall-Neal Furnace Co., 1326 N. Capitol Ave., Indianapolis 7.
Hallstead Iron Foundry, Hallstead, Pa.
Hamblin & Russell Mfg. Co., Inc., Worcester, Mass.
Hammel Radiator Engineering Co., 3345 Motor Ave., Los Angeles 34.
Hammett Electric Mfg. Co., 2558 McGee Trafficway, Kansas City 8, Mo.
Hammond Machinery Builders, 1694 Douglas Ave., Kalamazoo 54, Mich.
Hampton Electric Mfg. Co., Third & Archie Sts., Oakmont, Pittsburgh.
Handelan Washed Air Co., 4006 Washburn Ave. South, Minneapolis.
Handley Brown Heater Co., 209 E. Washington Ave., Jackson, Mich.
Handy & Harman, 82 Fulton St., New York City 7.
Hansen Electric Co., 650 Valencia St., San Francisco 10.
Hansen Mfg. Co., Inc., Princeton, Ind.
Hardinge Oil Burner & Mfg. Co., 1770 Berteau Ave., at Ravenswood, Chicago 13.
Hare Engineering Co., 155 W. Congress St., Detroit 26.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee.
Harrington Co., 1642 W. Callowhill St., Philadelphia 30.
• Harrington & King Perforating Co., 5649 Fillmore St., Chicago 44.
Harris, A. R., 4546 Hohman Ave., Hammond, Ind.
Harris Calorific Co., 5501 Cass Ave., N. W., Cleveland.
• Hart & Cooley Mfg. Co., 500 E. Eighth St., Holland, Mich.
Hart & Crouse Corporation, 301 Turner St., Utica, N. Y.

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Hart Mfg. Co., Bartholomew & Hamilton Sts., Hartford, Conn.
Hart Mfg. Co., 2006 N. Western Parkway, Louisville 3, Ky.
Hartwell Engineering Co., 3417 Crenshaw Blvd., Los Angeles 16.
Hartzell Propeller Fan Co., 1025 Roosevelt Ave., Piqua, O.
Harvey, Inc., Sid, 108 E. Mineola Ave., Valley Stream, N. Y.
• Harvey-Whipple, Inc., 55 Emery St., Springfield 1, Mass.
Haskins Co., R. G., 615 S. California Ave., Chicago 12.
Haskins-Haire Wire Works, 9 May St., Worcester 3, Mass.
Hassall, Inc., John, Clay & Oakland Sts., Brooklyn 22.
Hastings Air Conditioning Company, Inc., Box 474, 108 S. Colorado Ave., Hastings, Nebr.
Hauck Manufacturing Co., 124-136 Tenth St., Brooklyn 15.
Hauserman Co., E. F., 6800 Grant Ave., Cleveland 5.
Hays Corp., 782 E. Eighth St., Michigan City, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Healy Ruff Co., 765 Hampten Ave., St. Paul 4, Minn.
Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.
Heath & Milligan Mfg. Co., Div. of The Glidden Co., 1833 S. Normal Ave., Chicago.
Heating Assurance, E. 124 Augusta, Spokane, Wash.
Heating Equipment Co., 600 Indiana St., San Francisco 7.
Heatlox Furnaces, Inc., 4320 S. Tacoma Way, Tacoma 9, Wash.
Heat-Seal Burner Company, 2018 Cuming Ave., Omaha 2, Nebr.
Hegeler Zinc Co., P. O. Box 599, Danville, Ill.
• Heil Co., 3000 W. Montana St., Milwaukee 1.
Hemp & Company, Inc., Macomb, Ill.
Hendley & Whittemore Co., 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry & Wright Mfg. Co., 760 Windsor St., Hartford 1, Conn.
Henry Company, Paul, Thermal Div., 2037 S. La Cienega Blvd., Los Angeles 34.
• Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., 6th & Harrison St., Nashville, Tenn.
Herbusch Corporation, The, Simplex Control Div., 706 Chestnut St., St. Louis 1.
Herco Oil Burner Corp., 109 W. Chestnut St., Lancaster, Pa.
Hercules Chemical Co., Inc., 332 Canal St., New York City.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7.
Herd Utilities, Inc., 303 Canal St., Providence 3, R. I.
Heremetal Co., 202 Washington Ave., N., Minneapolis.
Heritage Coal & Stoker Co., 105 E. 63rd St., Chicago 37.
Herrmann & Grace Co., 671 Bergen St., Brooklyn, N. Y.
Herron-Zimmers Molding Co., 3900 E. Outer Drive, Detroit.
Hershey Machine & Foundry Co., Manheim, Pa.
Hess-Snyder Co., Massillon, Ohio.
• Hess Warming & Ventilating Co., 1221-1227 S. Western Ave., Chicago 8.
Hetzel Roofing Products Co., 67 Main St., Newark, N. J.
Hexacon Electric Company, 161 W. Clay, Roselle Park, N. J.
Hill, E. Vernon, 6826 W. Highland Ave., Chicago.
Hillwood Manufacturing Co., 21600 St. Clair Ave., Cleveland 17.
Hilo Varnish Corp., 42-60 Stewart Ave., Brooklyn, N. Y.
Hinde & Dausch Paper Co., P. O. Box 861, Sandusky, O.
Hipoint Corp., Water, Elm & Arnold Sts., Bellefontaine, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Hobart Brothers Co., Canal Lock Square, Troy, O.
Hodell Chain Co., 3924 Cooper Ave., Cleveland 3.
Hogan & Co., Inc., C. T., 383 Madison Ave., New York 17.
Hodgman Rubber Co., Framingham, Mass.
Holcomb & Hoke Mfg. Co., 1545 Van Buren St., Indianapolis 7.
Holden-Soules, Inc., 6535 Linwood Ave., Detroit 8.
Hollup Corp., Div. National Cylinder Gas Co., 3357 W. 47th Place, Chicago.
• Holly Heating & Mfg. Co., 375 Arroyo Parkway, Pasadena, Calif.
Holtum Mfg. Co., Freeport, Ill.
Holtzer-Cabot Electric Co., Div. First Industrial Corporation, 125 Amory St., Boston 19.
Home Furnace Co., 6th St. & P. M. R. R., Holland, Mich.
Home Stove Co., 501 Kentucky Ave., Indianapolis.
Homer Furnace & Foundry Corporation, Coldwater, Mich.
Hones, Inc., Charles A., 122 S. Grand Ave., Baldwin, N. Y.
Hood Co., B. Mifflin, Daisy, Tenn.
Horn Co., A. C., 43-36 Tenth St., Long Island City 1, N. Y.
Horst Mehl Mfg. Co., 245 Fifth Ave., New York City 1.
Horton Mfg. Co., 3008 University Ave., S. E., Minneapolis.
• Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotentot Co., Inc., 2423 Farnam St., Omaha 2, Nebr.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4.
Howe and Bassett Co., Inc., 840 University Ave., Rochester, N. Y.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago 18.
Howell Electric Motors Co., Howell, Mich.
Howes-Woods Co., 210 Bridge St., Cambridge 41, Mass.
Hoyt Heater Co., 2146 E. 25th St., Los Angeles 11.
Hub Specialty Co., 122 Orchard St., W. Somerville 44, Mass.
Hubbard Co., 1014 Marquette Ave., Minneapolis.
Hubbell Corp., 319 N. Albany Ave., Chicago 12.
Hueller Mfg. Co., Inc., H. J., 559 Rogers Ave., Brooklyn, N. Y.
Hunt & Son, C. B., 1913 E. Pershing St., Salem, Ohio.
Hunter Fan & Ventilating Co., 400 S. Front St., Memphis, Tenn.
• Hussey & Co., C. G., 2850 Second Ave., Pittsburgh 19.
Huwer Heating Corp., 2375 West Fort St., Detroit 16.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8.
Hyatt Bearings Division, General Motors Corp., Harrison, N. J.
Hyman & Sons, Joseph, Tioga, Livingston and Almond St., Philadelphia 34.

I

Ice Cooling Appliance Corp., Morrison, Ill.
Ideal Commutator Dresser Co., 1084 Park Ave., Sycamore, Ill.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Furnace Co., 901 Fisher Bldg., Detroit 2.
Ideal Heating Corp., 807 East Gage Ave., Los Angeles.
Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41.
• Illinois Iron & Bolt Co., 918 S. Michigan Ave., Chicago 5.
• Illinois Bronze Powder Co., Inc., 2023 S. Clark St., Chicago 16.
Illinois Testing Laboratories, Inc., 412 N. LaSalle St., Chicago 10.
Illinois Zinc Co., 2959 W. 47th St., Chicago 32.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7.
Imperial Electric Co., 64 Ira Ave., Akron 9, O.
Imperial Molded Products Corp., 2925 W. Harrison St., Chicago.
Independence Stove & Furnace Co., Cor. Hayward & Cottage, Independence, Mo.
• Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6.
• Independent Register Co., 3747 E. 93rd St., Cleveland 5.
• Indiana Fan Co., 36 E. South St., Indianapolis 4, Ind.
Industrial Engineering Corporation, Terre Haute, Ind.
Industrial Mfg. & Engineering Co., 3845 N. Ravenswood Ave., Chicago 13.
Industrial Research, Lansdowne, Pa.
Industrial Screw Company, 711 W. Lake St., Chicago 6.
Industrial Service Laboratories, 7656 W. Forest Home Ave., Milwaukee.
Inferno Co., P. O. Box 1138, Shreveport, La.
Ingersoll-Rand Co., 11 Broadway, New York City 4.
Ingersoll Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago.
Inland Steel Co., 38 S. Dearborn St., Chicago 3.
Insto-Gas Corporation, 1900 E. Jefferson, Detroit 7.
Insulating Equipment, Inc., 39 S. LaSalle St., Chicago 3.
Insul-Wool Insulation Corp., Wichita 12, Kansas.
Insulite Div. Minnesota and Ontario Paper Co., 500 Baker Arcade Bldg., Minneapolis 2.
Inter-Coastal Paint Co., 15th & Southern R. R., East St. Louis, Ill.
International Engineering, Inc., 1145 Bolander, Dayton 1, O.
International Engineering Wks., Inc., Framingham, Mass.
• International Heater Co., 101 Park Ave., Utica 2, N. Y.
International Moistening Co., 489 S. Main St., Providence, R. I.
International Nickel Co., Inc., 67 Wall St., New York City 5.
International Register Co., 2620 W. Washington Blvd., Chicago 12.
International Sales Co., 2045 Evans Ave., San Francisco 24.
International Steel Co., 1556 Edgar St., Evansville, Ind.
International Vermiculite Co., Girard, Ill.
• Interstate Machinery Co., Inc., 1433 W. Pershing Road, Chicago 9.
Interstate Metal Products Company, Inc., 666 N. Lake Shore Dr., Chicago.
Interstate Sales Co., 1123 Broadway, New York City 10.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Iowa Foundry Co., W. 2nd & Cook, Sioux City, Ia.
Iowa Paint Mfg. Co., 118-20 Eighth St., Des Moines 9, Ia.
Iron Fireman Mfg. Co., 3121 W. 106th St., Cleveland 11.
Irving Varnish and Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.
Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

J

• J. K. Supply Co., Wells St., Sandwich, Ill.
Jackson-Bangor Slate Co., Pen Argyl, Pa.
Jackson Co., Byron, P. O. Box 3017, Terminal Annex, Los Angeles 54.
• Jackson & Church Co., 321 N. Hamilton St., Saginaw 65, Mich.
Jackson Sheet Metal Works, 3012 Washington Ave., Ogden, Utah.
Jacobs Co., B. & J., 1725 Johns St., Cincinnati.
Jacobson Machine Works, Inc., A. E., 1090 Tenth Ave., S. E., Minneapolis.
Jaden Mfg. Co., 1601 W. 2nd St., Hastings, Nebr.
Jamar Co., Walker, 367 S. First Ave., E., Duluth, Minn.
James Regulator Co., Inc., 382 Peacock St., Pottsville, Pa.
Jamestown Metal Corp., 104 Blackstone Ave., Jamestown, N. Y.
Jamieson Mfg. Co., 820 Eagle Ford Road, Dallas, Tex.
• Janette Mfg. Co., 556 W. Monroe St., Chicago 6.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Machine Tool Co., Fourth, Cutter & Sweeney Sts., Cincinnati 3.
• Jennings, Freeland L., P. O. Box 75, Lima, Ohio.
Jessop Steel Co., Lock Box 489, Washington, Pa.
Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.
Jiffy Manufacturing Co., Hillside, N. J.
Joal Mfg. Corp., 2058 Canton St., Toledo 2.
Johns-Manville, 22 E. 40th St., New York City 16.
Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.
• Johnson Co., Lloyd S., 2241 Indiana Ave., Chicago 16.
Johnson Manufacturing Corporation, Albion, Mich., and Chrysler Building, New York City.

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Johnson Co., S. T., 940 Arlington Ave., Oakland 8, Calif., and 401 N. Broad St., Philadelphia.
Johnson Fan & Blower Corp., 1319 W. Lake St., Chicago.
• Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
Johnson, Inc., William, Brenner & Kent Sts., Newark 3, N. J.
Johnson Ladder & Shoe Co., Eau Claire, Wisconsin.
Johnson Service Co., 507 E. Michigan St., Milwaukee.
Johnson & Chapman Co., 2925 Carroll Ave., Chicago.
Johnston Co., Wm. W., 115 Bayard St., Dayton, O.
Johnston Gas Furnace Corp., 11847 Vose St., North Hollywood, Calif.
Johnston Tin Foil & Metal Co., 6100 S. Broadway, St. Louis 11.
Joliet Heating Corp., 1403 Herkimer St., Joliet, Ill.
Jones & Laughlin Steel Corp., Third Ave. & Ross St., Pittsburgh 30.
Jones Foundry & Machine Co., W. A., 4401 W. Roosevelt Rd., Chicago 24.
Jones Products Corporation, Ferndale, Mich.
Jordan & Co., Paul R., 311 E. South St., Indianapolis 4.
Josam Manufacturing Co., 1783 E. 11th St., Cleveland 14.
Judson Pacific Co., 1200 17th St., San Francisco & Emeryville, Calif.
Juniper Elbow Company, Inc., 72-15 Metropolitan Ave., Middle Village, L. I., N. Y.

K

Kais Sunrise Works, 5659 Linwood Ave., Detroit 8.
Kalamazoo Stove & Furnace Company, 453 Rochester Ave., Kalamazoo 6, Mich.
Kaiser Co., H. S., 3336 Franklin Blvd., Chicago.
• Kalamazoo Tank & Silo Co., Machine Tool Div., 508 Harrison St., Kalamazoo 16, Mich.
Kane Mfg. Corporation, Kane, Pa.
• Kane & Roach, Inc., Niagara & Shownard Sts., Syracuse, N. Y.
Kateiman Foundry & Mfg. Co., Third Ave. & Eleventh St., Council Bluffs, Iowa.
Kauffman Air Conditioning Corp., 4336 W. Pine Blvd., St. Louis 8.
Kaufman Co., H. J., 13215 Roselawn Ave., Detroit 4.
Kaustine Company, Inc., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kaybar Burner Corp., 4545 Cottage Grove Ave., Chicago.
Kaye & McDonald, Inc., 92 Franklin Ave., West Orange, N. J.
Kaynar Manufacturing Co., 820 E. 16th St., Los Angeles 21.
Keasbey Co., Robert A., 139 W. 19th St., New York City 11.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Keckley Company, O. C., 400 W. Madison St., Chicago 6.
Kehm Corporation, 135 S. LaSalle St., Chicago 3.
Keith Furnace Co., Dean Ave. at E. 26th, Des Moines 17, Ia.
Keldur Corp., 420 Lexington Ave., New York City 17.
Keller Tool Company, P. O. Box 268, Grand Haven, Mich.
Kelley Manufacturing Co., P. O. Box 17, Houston, Texas.
Kelsey Heating Co., Inc., 277 James St., Syracuse, N. Y.
Kelvinator Division, Nash-Kelvinator Corp., 14250 Plymouth Rd., Detroit 32.
Kelvin-White Co., 90 State St., Boston 9.
Kennard Corporation, 2021 S. Hanley Rd., St. Louis 17.
Kent Co., Inc., 167 Canal St., Rome, N. Y.
Kent & Co., Inc., J. King, 6477 Manchester Ave., St. Louis 10.
Kerentoff, G. L., 2218 Reading Road, Cincinnati 2.
Kernchen Co., 333 N. Michigan Ave., Chicago.
Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh 22.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39.
Keystone Asphalt Products Co., 43 E. Ohio St., Chicago 11.
Keystone Carbon Co., Inc., St. Marys, Pa.
Keystone Flashing Company, 2310 N. 28th St., Philadelphia 32.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 2013 43rd St., North Bergen, N. J.
Kilham Gas Burner Co., 236 Broadway, Denver, Colo.
Kimberly-Clark Corp., Neenah, Wis.
King Metal Co., 414 N. W. Fourth St., Oklahoma City, Okla.
King Ventilating Co., Box 178, Owatonna, Minn.
Kingston Products Corporation, 1415 N. Webster, Kokomo, Ind.
Kinnear Mfg. Co., P. O. Box 598, Columbus 16, O.
Kirk & Blum Mfg. Co., 2883 Spring Grove Ave., Cincinnati 25.
Kisco Company, Inc., 39th and Choteau, St. Louis 10.
Klaine Company, F. A., Front and Central, Cincinnati 2.
Klauer Mfg. Co., 9th & Washington St., Dubuque, Ia.
Klee Co., George B., 3501 Colerain Ave., Cincinnati 23, Ohio.
Kleenaire Corp., 409 Jefferson St., Stevens Points, Wis.
Kleen-Heet, Inc., 1823 Carroll Ave., Chicago.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros. Engineering Works, 1300 N. Kostner Ave., Chicago 51.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago 12.
Kluegel & Co., E., 187 W. Kellogg Blvd., St. Paul, Minn.
Knickerbocker Co., 603 Liberty St., Jackson, Mich.
Knowles Mushroom Ventilator Co., 11 Label St., Montclair, N. J.
Koil-Les Heater Co., Geneva, Ill.
Kol-Master Corp., Oregon, Ill.
Koons Furnace Co., 219 W. Van Buren, Danville, Ill.
Kopperman & Sons, Joseph, 316 New St., Philadelphia 6.
Koppers Co., Inc., Koppers Bldg., Pittsburgh 19.
Korb-Pettit Wire Fabrics & Iron Works, Inc., 1505 N. Mascher St., Philadelphia 22.
Korfund Co., Inc., 48-15 32nd Pl., Long Island City 1, N. Y.
Korth Oil Burner Corp., 123 Hawthorne St., Roselle Park, N. J.
Kortz Blower Mfg. Co., 117 Michigan St., N. W., Grand Rapids, Mich.
Kraissl Co., Inc., Terhune & Williams Aves., Hackensack, N. J.
Kraker, Henry, 54 W. 14th St., Holland, Mich.
Kramer Bros. Foundry Co., 17 Dell St., Dayton 4, O.
Kramer Trenton Co., 626 Brunswick Ave., Trenton 5, N. J.
• Krauser-Boyd, Inc., 553 River Road, North Tonawanda, N. Y.
Kraus Mfg. Co., Charles E., 929 W. Main St., Louisville 2, Ky
Krehbiel Co., J. H., 425 N. Crawford Ave., Chicago.
• Kresky Mfg. Co., 307 Third St., Petaluma, Calif.
• Krueger Sentry Gauge Company, Green Bay, Wis.
Kruse Company, 353 W. 16th Pl., Indianapolis.

L

Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Louis 1.
Laclede Steel Co., 1317 Arcade Bldg., St. Louis 1.
Laco Oil Burner Co., 238 Union St., Griswold, Ia.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
LaDel Conveyor & Mfg. Co., S. Broadway & Mill Ave., New Philadelphia, O.
Ladon Co., 902 S. Wabash Ave., Chicago.
Lamb & Ritchie Co., 250 Albany St., Cambridge 39, Mass.
Landis & Gyr, Inc., 104 Fifth Ave., New York 11.
• Langsenkamp Co., F. H., 229 E. South St., Indianapolis 4.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
Lastik Products Co., Inc., 1106 Keenan Bldg., Pittsburgh.
• Lau Blower Co., 2005 Home Ave., Dayton 7, O.
Layne & Bowler, Inc., Box 215, Hollywood Sta., Memphis 8, Tenn.
• Leader Iron Works, Inc., 2841 N. Jasper St., Decatur 60, Ill.
Leahy Manufacturing Co., 1804 E. 8th St., Los Angeles.
Leas, Co., H. Leslie, Monona, Ia.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledkote Products Co., 35-01 Vernon Blvd., Long Island City, N. Y.
Lee Co., K. O., P. O. Box 970, Aberdeen, S. D.
Lee Engineering Company, 1102 Union National Bk. Bldg., Youngstown 3, Ohio.
Lee & Son, Thomas, 128-132 W. Second St., Cincinnati 2.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44.
Lees, John, Div., Serrick Corp., Muncie, Ind.
Leeson Air Conditioning Corporation, 14631 Meyers Rd., Detroit 27.
Leffel & Co., James, 426 East St., Springfield, O.
Lehigh Fan & Blower Co., Front & Linden Sts., Allentown, Pa.
Lehon Company, 4425 Oakley Ave., Chicago 9.
Leland Electric Co., Inc., 1501 Webster St., Dayton 4, O.
Lenk Mfg. Company, Newton Lower Falls 62, Mass.
Lennox Furnace Co., 200 S. 12th Ave., Marshalltown, Iowa; 1705 Olentangy River Rd., Columbus, Ohio; 400 N. Midler Ave., Syracuse, N. Y.
Leslie Welding Co., 2943 Carroll Ave., Chicago.
• Levow, David, 308 W. 20th St., New York City 11.
Levy Bros. Company, 2334-2246 E. 38th St., Los Angeles.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Company, Lewin Metals Div., 12th & Chateau Sts., St. Louis 2.
Lewis & Co., Inc., Chas. S., 2207 Pine St., St. Louis 3.
Lewis Laboratories, Inc., Paul, 922 N. 4th St., Milwaukee 3.
Libbey-Owens-Ford Glass Co., Box 1765 & 1766, Toledo 3, Ohio.
• Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Lignum-Vitae Products Corp., 96 Boyd Ave., Jersey City, N. J.
Lincoln Electric Co., 12818 Coit Rd., Cleveland 1.
Linde Air Products Co., 30 E. 42nd St., New York City 17.
Linderme Machine & Tool Co., Inc., 12233 Covie Ave., Detroit.
Lindsay Corporation, 222 W. Adams St., Chicago 6.
Linear Packing & Rubber Co., Inc., State Road & Levick St., Tacony, Philadelphia 35.
Link-Belt Co., Stoker Div., 2410 W. 18th St., Chicago 8.
Lion Mfg. Corp., 2640 W. Belmont Ave., Chicago.
Liquefied Gas Appliance Co., Mars, Pa.
Lissberger & Son, Inc., Marks, 23-01 Borden Ave., Long Island City, N. Y.
Little Burner Co., Inc., H. C., 2nd & Lincoln, San Rafael, Calif.
Little Janitor Furnace Clock Co., 621 Broadway, New York City.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2.
Little Giant Vaporizer Co., 5101 Classen Blvd., Oklahoma City 6.
Livingston Repair, Marshall, Mich.
• Lockformer Co., 4615 Arthington St., Chicago 44.
Lochinvar Products Div., Michigan Tank & Furnace Corp., 14101 Prairie Ave., Detroit 4.
Lockjoint Wood Products Co., 1721 Mildred Ave., Wichita 7, Kan.
Logan Co., Inc., 1115 Franklin St., Louisville 6, Ky.
Logan-Long Co., 37 W. Van Buren St., Chicago.
Lonergan Manufacturing Co., Albion, Mich.
Lookout Boiler & Mfg. Co., Manufacturers Road, Chattanooga, Tenn.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Louden Company, Fairfield, Iowa.
Lovejoy Flexible Coupling Co., 5072 W. Lake St., Chicago 44.
Lovekin Water Heater Co., 21-43 Laurel St., Philadelphia 23.
Lucas & Company, Inc., John, 322 Race St., Philadelphia.

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Ludowici-Celadon Co., 104 S. Michigan Ave., Chicago.
• Lukens Metal Co., Thos. F., Hedley & Bath Sts., Philadelphia.
Lukens Steel Co., 308 S. First Ave., Coatesville, Pa.
Lumm Co., A. H., 2512 Albion St., Toledo 6, O.
Lundy Co., E. A., 420 Lexington Ave., New York 17.
Lyman Co., H. B., Southampton, Mass.
Lynch Manufacturing Corporation, Defiance, O.
Lyon Conklin & Co., Inc., Race & McComas Sts., Baltimore 30.
Lyon Metal Products, Inc., P. O. Box 671, Aurora, Ill.

M

M B Manufacturing Company, Inc., 1060 State St., New Haven 11, Conn.
Maas & Waldstein Co., 438 Riverside Ave., Newark 4.
McAlear Mfg. Co., 1901 S. Western Ave., Chicago 8.
McClure Builders' Supply Co., East Palestine, O.
McCollum Hoist & Mfg. Co., 721 Rogers St., Downers Grove, Ill.
McCord Corporation, 2587 E. Grand Blvd., Detroit 11.
McCorkle Co., D. H., Sixth & Bancroft Way, Berkeley 2, Calif.
• McDonnell & Miller, 400 N. Michigan Ave., Chicago 11.
McIlvaine Products, Inc., 1516 Callowhill St., Philadelphia 30.
McKay Co., York, Pa.
McLeod & Henry Co., Inc., 395A First St., Troy, N. Y.
McPherson Furnace & Supply Co., 1805 N. E. 2nd Ave., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13.
• Made-Rite Furnace Pipe & Fittings Co., 10th & Monroe St., Newport, Ky.
MaGirl Foundry & Furnace Works, P. H., 413 E. Oakland Ave., Bloomington, Ill.
Mahon Co., R. C., 8650 Mt. Elliott Ave., Detroit.
• Maid-O'-Mist, Inc., 215 N. Aberdeen St., Chicago 7.
Main Cornice Works, 1416 N. Main St., Los Angeles.
• Majestic Co., 733 Erie St., Huntington, Ind.
Majestic Flashing Company, Reisterstown Rd. at Elgin Ave., Baltimore 17.
Majestic Furnace Co., 1723 Westlake Ave., N., Seattle, Wash.
Malco Gear Co., 13904 Lincoln Ave., Dolton, Ill.
Mall Tool Company, 7740 South Chicago Ave., Chicago 19.
Malleable Iron Fittings Co., Lock Box 231, Branford, Conn.
Mallory & Company, Incorporated, P. R., Ray F. Storrow Bldg., Indianapolis, Ind.
Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Manheim Manufacturing and Belting Co., Manheim, Pa.
Manning, Maxwell & Moore, Inc., 11 Elias St., Bridgeport, Conn.
Manufacturer's Fin Coil Co., 2505 S. Pulaski, Rd., Chicago 23.
Maple City Furnace Co., 605 S. Main St., Monmouth, Ill.
Maple Valley Mfg. Co., First St., Mapleton, Ia.
Maplewood Machinery Co., 2634 Fullerton Ave., Chicago 47.
Marathon Electric Mfg. Corp., Cherry & Randolph Sts., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Marley Chemical Co., 6537 Russell St., Detroit.
Marley Co., 3001 Fairfax Rd., Kansas City 15, Kan.
Marlin-Rockwell Corporation, Jamestown, N. Y.
Marlo Coil Company, 6135 Manchester Ave., St. Louis 10.
Marquette Mfg. Co., Inc., 401-409 Johnson St., N. E., Minneapolis, Minn.
Marsh Corporation, Jas. P., 2073 Southport Ave., Chicago 14.
Marsh Lumber Co., Inc., 535-611 Tuscarawas Ave., Dover, O.
Marshall Furnace Co., Dobbins & Hanover Sts., Marshall, Mich.
Marshallan M'f'g Co., 1061 W. 11th St., Cleveland.
• Marshalltown Mfg. Co., 901 E. Nevada St., Marshalltown, Ia.
Martens & Stormoen, 15 Hathaway St., Boston 16.
Martin Fan & Blower Co., 4634 W. 21st Place, Chicago 50.
Martin Co., Glenn L., Baltimore 3, Md.
Martin, J. O., and C. U., 647 Minna St., San Francisco.
Martocello & Co., Jos. A., 229 N. 13th St., Philadelphia 7.
Mason-Neilan Regulator Co., 1190 Adams St., Dorchester, Boston 24.
Mason & Sons, F. E., Batavia, N. Y.
Masonite Corp., 111 W. Washington St., Chicago 2.
• Master Electric Co., 126 Davis Ave., Dayton 1, O.
Matt Coil-Less Burner Co., 4015 W. Lake St., Chicago 24.
Matthiessen & Hegeler Zinc Co., LaSalle, Ill.
Mauer Engineering, 2525 Colfax St., Evanston, Ill.
Maurath Inc., 7309 Union Ave., Cleveland.
• Maurey Mfg. Co., 2915 S. Wabash Ave., Chicago 16.
Maxfield Manufacturing Co., 519 S. Main St., Temple, Tex.
• May-Fiebeger Co., S. 21st St., Newark, O.
• Mayflower Air Conditioners, Inc., 5th Floor, Finch Industrial Bldg., 5th & Wacouta, St. Paul, Minn.
Maxant Button & Supply Co., 117 S. Morgan St., Chicago 7.
Mayflower Oil Burner Corp., 5002 Hudson Blvd., West New York, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
May Oil Burner Div., Gerotor May Corp., Maryland Ave. & Oliver St., Baltimore 3, Md.
Maysteel Products, Inc., 135 W. Wells St., Milwaukee 3.
Maze Co., W. H., Peru, Ill.
Medart Co., 3500 DeKalb St., St. Louis.
Meier Electric & Machine Co., 3525 E. Washington St., Indianapolis 7.
Mellish & Murray Co., 1715 Carroll Ave., Chicago 12.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46.
• Mercoid Corp., 4201 Belmont Ave., Chicago 41.
Mercury Clutch Corporation, 1520 12th St., S. W., Canton 6, Ohio.
Meriam Instrument Co., 10920 Madison Ave., Cleveland 2.
Merit Water Heater Co., 133 E. Palmer St., Compton, Calif.
Merkle-Korff Gear Co., 217 N. Morgan St., Chicago 7.
Mesker & Co., Geo. L., 400 N. W. First St., Evansville 8, Ind.
Metal Door & Trim Co., La Porte, Ind.
Metal Marker Co., 1380 E. 40th St., Cleveland.
Metal & Thermit Corp., 120 Broadway, New York City 5.
Metropolitan Refining Co., 23 50th Ave., Long Island City, N. Y.
Mettler Co., Lee B., 406 S. Main St., Los Angeles 13.
Metzner Stove Repair Co., 515 Wyandotte, Kansas City 6, Mo.
• Meyer & Bro. Co., F., 1313 S. Adams St., Peoria, Ill.
• Meyer Furnace Co., 1300 S. Washington St., Peoria 2, Ill.
Meyer Mfg. Co., 2536 Fourteenth St., Detroit 16.
Meyers Fuel Saver Co., Inc., 313 W. Milwaukee St., Janesville, Wis.
Meyers Mfg. Co., Fred L., 1520 Bender, Hamilton, Ohio.
Michell Air Conditioning Co., Inc., 1725 State St., Schenectady, N. Y.
Michigan Tank & Furnace Corp., Lochinvar Products Div., 1401 Prairie Ave., Detroit 4.
Micro Products Co., 20 N. Wacker Dr., Chicago 6.
Middleton Mfg. & Sales Co., 125 N. First St., Minneapolis.
Midland Paint & Varnish Co., 9115 Reno Ave., Cleveland 5.
Midland Refractories Corporation, 135 S. LaSalle St., Chicago 3.
Mid-States Equipment Co., 2429 S. Michigan Ave., Chicago 16.
Midwest Aluminum Products, Inc., 123 E. Pittsburgh Ave., Milwaukee.
Midwestern Supply Co., 1106 N. Clinton Blvd., Bloomington, Ill.
• Milcor Steel Co., 4117 W. Burnham St., Milwaukee 4.
Miller Co., Meridan, Conn.
Miller Heat-O-Meter Company, 1434 W. Atkinson Ave., Milwaukee 6.
Miller & Doing, 64 York St., Brooklyn 1.
Miller & Son, C. Arthur, 202-204 S. Main St., Elmira, N. Y.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller Floor Furnace Co., 741 E. 14th St., Oakland, Calif.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mill-Rose Co., 2498 E. 79th St., Cleveland, O.
Mills Corp., Elmer E., 153 W. Huron St., Chicago 10.
Mills Novelty Co., 4110 W. Fullerton Ave., Chicago.
• Milton Equipment Co., 402 Race St., Philadelphia 6.
Milwaukee Brush Mfg. Co., 2236 N. 30th St., Milwaukee.
Milwaukee Gas Specialty Company, 2025 W. Clybourn, Milwaukee.
Mineral Insulation Co., 103rd & South West Highway, Chicago Ridge, Ill.
• Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., S. Minneapolis 8.
Minnesota Mining & Manufacturing Co., 900 Fauquier Ave., St. Paul 6.
Minn-Kota Foundry & Mfg. Co., 201 Second St. N., Fargo, N. D.
Minster Machine Co., 270 W. 5th St., Minster, Ohio.
Misener Mfg. Co., Inc., 326 E. Washington St., Syracuse 2, N. Y.
Mississippi Glass Company, 200 Fifth Ave., New York.
Mission Water Heater Co., 7101 McKinley Ave., Los Angeles 1.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3.
Modine Mfg. Co., 17th St., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., P. O. Box 1115, Cincinnati.
Mohawk Asphalt Heater Co., Frankfort, N. Y.
Mohler Co., J. K., The, 151 Church Ave., Ephrata, Pa.
Monarch Engineering Company, 500-600 Linden Ave., Dayton, O.
Monarch Furnace Fittings Manufacturers, 4040 W. Lake St., Chicago.
Monarch Heating Co., 4661 Alger St., Los Angeles 26.
Monarch Mfg. Works, Inc., Salmon & Westmoreland Sts., Philadelphia 34.
Moncrief Furnace Co., P. O. Box 1673, Atlanta 1, Ga.
Moncrief Furnace & Mfg. Co., Inc., 3903 Main St., Dallas 1, Tex. Tex.
Monitor Controller Co., 51 S. Gay St., Baltimore 2.
Monogram Combustion Chamber Co., 3645 Cuthbert St., Philadelphia.
Montag Stove & Furnace Works, 2011 N. Columbia Blvd., Portland, Ore.
Montgomery Brothers, 61 Fremont St., San Francisco 5.
Moore Corp., Benton St., Joliet, Ill.
Moran Flexible Steam Joint Co., 217 W. Main St., Louisville, Ky.
• Morey, Dan, 816 S. Robertson Blvd., Los Angeles 35.
Morf Industries, 740 Manor Rd., Staten Island 2, N. Y.
Morris Machine Works, 31 E. Genesee St., Baldwinsville, N. Y.
• Morrison Products, Inc., 16816 Waterloo Rd., Cleveland.
• Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7.
Morse Chain Co., Box 568, Ithaca, N. Y.
Mortell Co., J. W., Hobbie Ave. & Big Four R. R., Kankakee, Ill.
Motex Metal Process Corporation, 4473-4475 W. Jefferson Ave., Detroit 9.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
• Mt. Vernon Furnace & Mfg. Co., P. O. Box 213, Mt. Vernon, Ill.

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Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.
Mueller Co., 512 W. Cerro Gordo St., Decatur 70, Ill.
• Mueller Furnace Co., L. J., 2005 W. Oklahoma Ave., Milwaukee 7.
Mullins Mfg. Corp., Warren, O.
Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis 8.
Muncie Gear Works, Inc., 700 N. Wysor, Muncie, Ind.
Mundet Cork Corp., 65 S. 11th St., Brooklyn 11.
Mundt & Sons, Charles, 53 Fairmont Ave., Jersey City 4, N. J.
Munn and Steele, Inc., 130 Lister Ave., Newark 5, N. J.
Murray Co., 3200 Canton Ave., Dallas 1, Tex.
Murray Corporation of America, 7700 Russell St., Detroit.
Murray Manufacturing Co., D. J., 1002-24 Third St., Wausau, Wis.
Murray Tile Co., Cloverport, Ky.
Mustee Heater Co., 3409 Superior Ave., Cleveland 14.
Mutual Liquid Gas & Equipment Co., 3600 W. Imperial Highway, Inglewood, Calif.
Myers & Bro. Co., The, F. E., Ashland, O.
Myers Electric Co., 410 Third Ave., Pittsburgh 19.
Myers Ladder Equipment Co., 3121 Buena Vista, Madison, Wis.

N

Naco Manufacturing Co., 7631 Roseberry Ave., Huntington Park, Calif.
National Airoil Burner Co., Inc., 1284 E. Sedgley Ave, Philadelphia 34.
National Brass Co., 1603 Madison Ave., Grand Rapids 2, Mich.
National Carbon Company, Inc., 30 E. 42nd St., New York 17.
National Cylinder Gas Co., 205 W. Wacker Dr., Chicago 6.
National Electric Welding Machines Co., 1846 N. Trumbull St., Bay City, Mich.
National Engineering & Manufacturing Co., 213 W. 19th St., Kansas City, Mo.
National Engineering Products, Inc., Commerce & Savings Bldg., Washington, D. C.
National Fireproofing Corp., 202 E. Ohio St., N. S., Pittsburgh.
National Foundry & Furnace Co., Station "B," Dayton 7, O.
National Gas Burner Div., Mid-Continent Metal Products Co., 1960 Clybourn Ave., Chicago 14.
National Gypsum Co., 325 Delaware Ave., Buffalo 2.
National Heater Company, 401 Essex Bldg., Minneapolis 2.
National Lead Co., 111 Broadway, New York City 6.
National Lock Co., Inc., Rockford, Ill.
National Machine Tool Co., 1536 Clark St., Racine, Wis.
National Mfg. Corp., 151 Fillmore Ave., Tonawanda, N. Y.
• National Metal Fabricators, 2136 S. Sawyer Ave., Chicago 23.
National Screw & Mfg. Co., 2440 E. 75th St., Cleveland.
National Sheet Metal Co., 1617-1629 Water St., Peru, Ill.
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Stoker Company, Inc., 2820 Locust St., St. Louis 3.
• National Super Service Co., 1944 N. 13th St., Toledo 2, O.
National Thermal Drive Co., Inc., Hwy. 61 and Kohlman Ave., St. Paul 9, Minn.
National Time & Signal Corp., 600 E. Milwaukee Ave., Detroit.
Nebel Manufacturing Co., P. O. Box 3942, Shaker Sq. Station, Cleveland 20.
Neemes Foundry, Inc., 286 First St., Troy, N. Y.
Nelson Chemical Co., 6564 Benson St., Detroit 7.
• Nelson Bros. & Strom Company, 1620 Racine St., Racine, Wis.
Nelson Co., 2604 4th Ave., Detroit.
• Nelson Corporation, Herman, 1824 Third Ave., Moline, Ill.
Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13.
Nelson Specialty Welding Equipment Corp., Dept. 5, 440 Peralta Ave., San Leandro, Calif.
Nesbitt, Inc., John J., State Rd. & Rhawn St, Philadelphia 36.
Nevinger Manufacturing Co., Inc., Greenville, Ill.
New-Aire Blower Co., 23768 Michigan Ave., Dearborn, Mich.
New Albany Machine Mfg. Co., E. 10th & Water Sts, New Albany, Ind.
New Delphos Mfg. Co., 102-124 S. Pierce St., Delphos, O.
New Departure, Div. General Motors Corp., Bristol, Conn.
New Haven Copper Co., Seymour, Conn.
New Jersey Zinc Co., 160 Front St., New York City 7.
Newman Brothers, Inc., 662-670 W. 4th St., Cincinnati 3.
New Mission Htg. & Vent. Co., 3401 Mission St., San Francisco.
New Monarch Machine & Stamping Co., 406 S. W. 9th St., Des Moines 8, Ia.
New Plastic Corporation, 1017 N. Sycamore, Hollywood 38, Calif.
Newport Rolling Mill Co., Div. Andrews Steel Co., 9th & Lowell Sts., Newport, Ky.
New Way Products Company, 955 Spitzer Bldg., Toledo, O.
New York Blower Co., 3155 Shields Ave., Chicago 16.
New York Wire Works, Inc., 107 Hunterdon St., Newark, N. J.
Niagara Blower Co., 6 E. 45th St., New York City 17.
• Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo 11.
Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40.
Niles Rolling Mill Co., Niles, O.
Niles Steel Products Division, Republic Steel Corp., 465 Walnut St., Niles, Ohio.
Norge Heating & Conditioning Div., Borg-Warner Corp., 12345 Kercheval Ave., Detroit 14.
Norgren Co., C. A., 222 Santa Fe Dr., Denver 9, Colo.
Nork Products Co., 5897 S. Main St., Los Angeles 3.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Norris Airless Painting Machinery Corp., 96 Greenwich Ave., Greenwich, Conn.
Norristown Magnesia & Asbestos Co., Washington St., Below Ford St., Norristown, Pa.
North American Fibre Products Co., National Building, Cleveland 13.
North Bangor Slate Co., Bangor, Pa.
Northern Blower Co., 6409 Barberton Ave., Cleveland 2.
Northern Furnace & Supply Co., 25th St. & 2nd Avenue North, Billings, Mont.
Northern Indiana Brass Co., 935 Plum St., Elkhart, Ind.
Northern Steel & Stoker Corp., 3100 Prospect Rd., Peoria, Ill.
Northern Weatherstrip Co., 367 S. 1st Ave., E., Duluth, Minn.
North Penn Co., 72 Fifth Ave., New York 11.
Northwest Lead Company, 2700 16th Ave., S. W., Seattle 4, Wash.
Northwest Foundry & Furnace Works, 2345 S. E. Gladstone St., Portland 2, Ore.
• Northwestern Stove Repair Co., 662 W. Roosevelt Rd., Chicago 7.
Nortmann-Duffke Co., 2740 S. 32nd St., Milwaukee 7.
Norton Brothers, 44 Main St., Greenville, N. Y.
Norwin Co., East Album St., Freeport, Ill.
Norwood Filtration Co., N. Maple St., Florence, Mass.
Nugent Furnace, Thos., 223 E. 80th St., New York 21.
NuSteel Company, 1714 S. Ashland Ave., Chicago 8.
• Nu-Way Corp., The, 2416 Fourth Ave., Rock Island, Ill.

O

Oakite Products, Inc., 22 Thomas St., New York 6.
Oakland Foundry Co., Avenue A & L & N Tracks, Belleville, Ill.
Obdyke, Inc., Benjamin P., 447 N. Eighth St., Philadelphia 23.
O'Brien Varnish Co., 101 N. Johnson St., South Bend 21, Ind.
Ohio Electric Mfg., Co., 5910 Maurice Ave., Cleveland 4.
Ohio Foundry and Manufacturing Co., Steubenville, O.
Ohio Paper Co., Miamisburg, Ohio.
Ohio Products Co., 16113 Munn Road, Cleveland 15.
Ohio Wire Products Co., 217 N. Tuscarawas Ave., Dover, Ohio.
Ohl & Co., Geo. A., 151-161 Oraton St., Newark, N. J.
Ohmiac Paint & Refining Co., 6550 S. Central Ave., Chicago 38.
Oil Devices, 341 E. Ohio St., Chicago 11.
O'Keefe & Merritt Co., 3700 E. Olympic Blvd., Los Angeles.
• Olsen Manufacturing Co., The C. A., Elyria, O.
• Omaha Stove Repair Works, 1206 Douglas St., Omaha 2, Nebr.
O'Neil-Irwin Manufacturing Co., 316 Eighth Ave., S., Minneapolis 15.
Orbon Stove Co., L. & N. and Sycamore St., Belleville, Ill.
Original Metal Forming Machine Co., 952 Twentieth Ave., Seattle 11, Wash.
Ormsby-Osterman Company, 3631 Cass Ave., St. Louis.
Osborn Co., J. M. & L. A., Div. Milcor Steel Co., 1541 E. 38th St., Cleveland 14.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14.
Overly Manufacturing Co., Washington Ave., Greensburg, Pa.
OverSpred Stoker Co., 1702-77 W. Washington St., Chicago 2.
Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1, O.
Ozone Air Company, 928 Cherry St., S. E., Grand Rapids, Mich.

P

Pacific Gas Heating Co., 2948 Twentieth St., San Francisco 10.
Pacific Lumber Co., 100 Bush St., San Francisco 4.
Pacific Pumps, Inc., Dresser Industries, 5716 Bickett St., Huntington Park, Calif.
Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit 31.
• Packard Electric Div., General Motors Corp., Detroit 2.
Packham Crimper Co., Oak St. & N. Y. C. Depot, Mechanicsburg, O.
Packless Metal Products Corp., 31 Winthrop Ave., New Rochelle, N. Y.
Page Steel & Wire Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Company, 2951 W. Carroll Ave., Chicago 12.
Paint-Point Corporation, 275 Passaic St., Newark, N. J.
Palmer Electric Co., 20 Sproat St., Detroit.
• Palmer Manufacturing Corp., 705 W. Jefferson St., Phoenix, Ariz.
Palmer Thermometers, Inc., 2501 Norwood Ave., Norwood, Cincinnati 12.
Pan-American Engineering Company, 820 Parker St., Berkeley, Calif.
Pangborn Corp., Pangborn Blvd., Hagerstown, Md.
Paraffine Companies, Inc., 475 Brannan St., San Francisco 19.
• Paragon Electric Co., 37 W. Van Buren St., Chicago 5.
Paragon Oil Burner Corp., 75 Bridgewater St., Brooklyn, N. Y.
Paramount Products Co., 545 Fifth Ave., New York City.
Park City Cornice Works, Inc., 729 Union Ave., Bridgeport 7, Conn.
Parker Appliance Co., 17325 Euclid Ave., Cleveland 12.
Parker Heating & Manufacturing Co., 1627 Third Ave., S., St. Petersburg, Fla.
• Parker-Kalon Corp., 190-192 Varrick St., New York City 14.

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Parker Rust-Proof Co., 2177 E. Milwaukee Ave., Detroit 11.
Parkersburg Iron & Steel Co., Drawer 1070, Parkersburg, W. Va.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Patent Novelty Company, Fulton, Ill.
• Patten Co., J. V., 200 DeKalb Ave., Sycamore, Ill.
Patterson Foundry & Machine Co., East Liverpool, O.
Patterson-Sargent Co., St. Clair, Kopp & 38th St., Cleveland 14.
• Payne Furnace Co., 336 N. Foothill Rd., Beverly Hills, Calif.
Peacard Co., M. A., 195 Dudley St., Roxbury Sta., Boston 19.
• Peck, Stow & Wilcox Co., Center St., Southington, Conn.
Pecora Paint Co., 4th St. & Erie Ave., Philadelphia 40.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40.
Peerless Electric Co., 2000 W. Market St., Warren, O.
• Peerless Foundry Co., 1853 Ludlow Ave., Indianapolis 7.
• Peerless Mfg. Corp., 1400 W. Ormsby St., Louisville 10, Ky.
Peerless of America, Inc., Marion, Ind.
Peerless Oil Burner Co., Inc., 3926 Main St., Kansas City, Mo.
Peerless Pump Div., Food Machinery Co., 301 West Avenue 26, Los Angeles 31.
Peerless Pump Div., Food Machinery Corporation, 1250 Camden Ave., S. W., Canton 6, Ohio.
Peninsular Stove Co., 2699 Gratiot Ave., Detroit.
Penn Boiler & Burner Mfg. Corp., Fruitville Rd., Lancaster, Pa.
• Penn Electric Switch Co., Goshen, Ind.
Penn Supply & Metal Corporation, 1831 N. Fifth St., Philadelphia 22.
• Penn Tool Company, 2415 N. Howard St., Philadelphia 33.
Penn Ventilating Co., 3252 Goodman St., Philadelphia 40.
Pennsylvania Engineering Works, 526 S. Jefferson St., New Castle, Pa.
Pennsylvania Flexible Metallic Tubing Co., 72nd st. & Powers Lane, Philadelphia 42.
Pennsylvania Furnace & Iron Co., P. O. Box 269, Warren, Pa.
Pennsylvania Range Boiler Co., 24th St. & Washington Ave., Philadelphia 46.
Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7.
Pennsylvania Wire Glass Co., 1612 Market St., Philadelphia 3.
Pentecost & Craft Co., 429 Wabash Ave., Terre Haute, Ind.
Perfection Grate & Stoker Co., 4 Fisk Ave., Springfield 1, Mass.
• Perfection Stove Co., 7609 Platt Ave., Cleveland 4.
• Perfex Corp., 500 W. Oklahoma Ave., Milwaukee 7.
Perkins Machine Co., 4 Perkins Ave., Warren, Mass.
Perkins Machine Gear Co., Springfield, Mass.
Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.
Perkinson & Brown, 412 N. Wolcott Ave., Chicago.
Permutit Co., 330 W. 42nd St., New York 18, N. Y.
Pernot & Rich, Inc., 2546 San Fernando Rd., Los Angeles 41.
Peters-Dalton, Inc., 17900 Ryan Road, Detroit 12.
Peterson Co., B. A., 200 W. Railroad, Dowagiac, Mich.
Peterson "Freezem" Mfg. & Sales Co., 316 Southwest Blvd., Kansas City, Mo.
• Petroleum Heat & Power Co., P. O. Box 1547, Stamford, Conn.
Pfanstiehl Chemical Co., 104 Lakeview Ave., Waukegan, Ill.
Pfeifer, Wm., 416 Greenwich St., New York City.
Pfening Co., Fred D., 1075 W. 5th Ave., Columbus 8, O.
Phelps Dodge Copper Products Corp., British American Tube Div., 40 Wall St., New York City.
Phelps Mfg. Co., 801 Thomas St., Little Rock, Ark.
Pheoll Manufacturing Co., 5700 Roosevelt Rd., Chicago 50.
Philadelphia Chain Block & Mfg. Co., Inc., Hancock & Norris Sts., Philadelphia.
Philadelphia Gear Works, Inc., Erie Ave. and G St., Philadelphia 34.
Philadelphia Thermometer Co., 6th & Cayuga Sts., Philadelphia 40.
Philadelphia Tramrail Co., 3458 N. Weikel St., Philadelphia 34.
Philco Corp., Tioga and C Streets, Philadelphia 34.
Phillips Cooling Tower Co., Inc., 114 Liberty St., New York City 6.
Phillips Drill Co., 4700 Fifth Ave., Chicago 44.
Phoenix Ice Machine Co., 2711 Church St., Cleveland.
Phoenix Ventilator Co., 1665 63rd St., Brooklyn.
Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Piatt Products Corporation, 1149 S. Pennsylvania Ave., Lansing 3, Mich.
Pier Equipment Mfg. Co., 1440 Milton St., Benton Harbor, Mich.
Pilley Brush Co., Fort Madison, Ia.
Pioneer Heat Regulator Division, Master Electric Co., 100 Davis Ave., Dayton 1, O.
Pioneer Roofing & Sheet Metal Co., 226 N. Main St., Muskogee, Okla.
Pioneer Water Heater Co., 3005 Andriba St., Los Angeles.
Pittsburgh Corning Corporation, 632 Duquesne Way, Pittsburgh 22.
Pittsburgh Furnace Parts Co., 109 Federal St., Pittsburgh.
Pittsburgh Lectrodryer Corp., P. O. Box 1766, Pittsburgh 30.
Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22.
Pittston Stove Co., P. O. Box 279, Pittston, Pa.
Plant Rubber & Asbestos Works, Inc., 537 Brannan St., San Francisco 7.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7.
Plastic Products Co., 6475 Georgia Ave., Detroit 11.
Pleasantaire Corp., 730 Tower Bldg., Washington 5.
Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago 14.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Plymouth Industries Inc., 1932 Harrison Ave., Plymouth, Ind.
• Pocahontas Fuel Company, Incorporated, Stoker Div., 340 E. 131st St., Cleveland 8.
Poe Co., C. W., Mayfield at Lee, Cleveland 18.
Poe, Ralph W., 306 W. Locust St., Canton, Ill.
Polk Mfg. Co., 2021-23 Winnebago St., Madison, Wis.
Pomona Pump, Fairbanks, Morse & Co., 206 E. Commercial St., Pomona, Calif.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry Baltimore 11.
Portland Stove Fdry. Co., 57 Kennebec St., Portland 2, Me.
Potomac Mfg. Co., 316 S. 10th St., Philadelphia 7.
• Potts, Son & Co., Inc., W. F., 1224 Cherry St., Philadelphia 7.
• Power Engineering Co., 540 N. Michigan Ave., Chicago 11.
Powermatic Ventilator Company, 4019 Prospect Ave., Cleveland 3.
Powers Regulator Co., 2720 Greenview Ave., Chicago.
Prat-Daniel Corporation, Port Chester, N. Y.
Precision Control Co., 899 Bryant St., San Francisco.
Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30.
Preferred Utilities Manufacturing Corp., 1860 Broadway, New York City 23.
• Premier Furnace Co., Lock Box 150, Dowagiac, Mich.
Premier Metal Etching Co., 21-03 44th Ave., Long Island City 1, N. Y.
Presstite Engineering Co., 3900 Chouteau St., St. Louis 10.
Propellair, Inc., 1345 Lagonda Ave., Springfield, O.
Protected Steel Products, McAdam Ave., Washington, Pa.
Protective Coatings, Incorporated, P. O. Box 3985, Stratmoor Station, Detroit 27.
Providence Wire Works, 84 Sprague St., Providence 7, R. I.
• Pryne & Co., Inc., Box 3307 Terminal Annex, Los Angeles 54.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis, 20.
Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago.
Pyramid Metals Co., 1334 N. Wells St., Chicago.
Pyrolite Products Co., 1221-31 W. 74th St., Cleveland 2.

Q

Quaker Mfg. Co., 223 W. Erie St., Chicago 10.
Quick Furnace & Supply Co., 215 Court Ave., Des Moines 9, Ia.
Quiet-Heet Mfg. Corp., 135 N. J. Railroad Ave., Newark 5, N. J.
Quigley Company, Inc., 527 Fifth Ave., New York 17.
Quimby Pump Div., H. K. Porter Co., Inc., 340 Thomas St., Newark 5, N. J.
• Quincy Stove Manufacturing Co., 807 S. Front St., Quincy, Ill.

R

R-S Products Corp., 4530 Germantown Ave., Philadelphia 44.
Racine Stoker Mfg. Co., 1014 Eighth St., Racine, Wis.
Racine Tool & Machine Co., Racine, Wis.
• Radiation Furnace Corp., 230 Bond St., Benton Harbor, Mich.
Radiator Specialty Co., 1722 Dowd Rd., Charlotte 1, N. C.
Rafter Machine Co., 259 Stephen St., Belleville, N. J.
Ramey Mfg. Co., 243 N. 5th St., Columbus, O.
Ramsey Chain Co., Inc., 1028 Broadway, Albany 1, N. Y.
Ramtite Co., Div. S. Obermayer Co., 2563 W. 18th St., Chicago 8.
Ranco Inc., 601 W. Fifth Ave., Columbus 1, O.
• Randall Graphite Products Corp., 609 W. Lake St., Chicago 6.
Ransome Co., 4030 Hollis St., Emeryville 8, Calif.
Ransome Machinery Co., Sub. Worthington Pump & Machinery Corp., Dunellen, N. J.
Rattan Mfg. Co., P. O. Box 1745, New Haven 7, Conn.
Rawlplug Co., Inc., The , 98 Lafayette St., New York 13.
Ray Oil Burner Co., 401-499 Bernal Ave., San Francisco 12.
Reading Chain & Block Corporation, 2100 Adams St., Reading, Pa.
Reading-Pratt & Cady Div., American Chain & Cable Co., Inc., Reading, Pa.
Redmond Co., A. G., Owosso, Mich.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Reed Unit-Fans, Inc., 1001 St. Charles Ave., New Orleans 8.
Reeves Pulley Co., 1000 N. Wilson St., Columbus, Ind.
Reeves Steel & Mfg. Co., Dover, O.
Refinite Corp., Refinite Bldg., Omaha 8.
Refractory & Insulation Corp., 120 Wall St., New York City 5.
Refrigeration Appliances, Inc., 923 W. Lake St., Chicago.
Refrigeration Economics Co., Inc., 1231 Tuscarawas St., E., Canton 4, Ohio.
Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 7, N. Y.
Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11.
Reichert Float & Mfg. Co., 2238 Smead Ave., Toledo 6, O.
Reif-Rexoil, Inc., 37 Carroll St., Buffalo.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4.
Reimuller Brothers Company, 9400 Belmont Ave., Franklin Park, Ill.
• Reiner & Campbell Co., Inc., 667 Norwood Terrace, Elizabeth 2, N. J.
Reliable Gas Products Co., 1024 Second Ave., W. S., Cedar Rapids, Ia.
Reliable Perforating Co., 2047 N. Wood St., Chicago.
Reliable Sheet Metal Engineering Co., 4334-50 S. Knox Ave., Chicago.

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Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd. N. E., Cleveland 10.
Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago 18.
Remco Products Corp., State and Hay Sts., York, Pa.
Rempe Co., 340 N. Sacramento Ave., Chicago.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
• Republic Steel Corp., Republic Bldg., Cleveland 1.
Research Corp., 405 Lexington Ave., New York 17.
• Research Products Corporation, 1015 E. Washington Ave., Madison 3, Wis.
Resistoflex Corporation, 39 Plaseon St., Belleville 9, N. J.
Retinning Manufacturing Co., 3021 Greenview Ave., Chicago.
• Revere Copper and Brass, Incorporated, 230 Park Ave., New York City 17
Rex Clay Products Company, 14414 Dexter Bldg., Detroit 6.
Rex Welder and Engineering Company, 7 E. 19th St., Kansas City 8, Mo.
Reynolds Electric Company, 2685 W. Congress St., Chicago 12.
Reynolds Mfg. Co., 412 Prospect N. E., Grand Rapids, Mich.
Reynolds Manufacturing Co., Springfield, Mo.
Reynolds Metals Co., Reynolds Metals Bldg., Richmond 19, Va.
Reznor Mfg. Co., Lock Box 231, Mercer, Pa.
• Rheem Manufacturing Co., Stokermatic Div., 1415 S. State St., Salt Lake City 4, Utah.
Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Ribside Furnace Co., 1191½ Clinton St., Wausau, Wis.
Richards, J. Merrill, 25 Huntington Ave., Boston 16.
Richards-Wilcox Mfg. Co., Third St., Aurora, Ill.
Richmond Fireproof Door Co., Northwest F St., Richmond, Ind.
Richmond Radiator Co., 535 Fifth Ave., New York 17.
Riddell, Inc., W. A., E. 7th & East Sts., Frederick, Md.
Riester & Thesmacher Co., 1526 W. 25th St., Cleveland 13.
Riggin Metal Products, Box 267, Kankakee, Ill.
Rigid-Tex Corporation, 658 Ohio St., Buffalo 3.
Riley Stoker Corp., 9 Neponset St., Worcester, Mass.
Rising & Nelson Slate Co., West Pawlet, Vt.
Rival Strap Corporation, 308 W. 20th St., New York City 11.
• Riverside Machinery Company, 10632 S. Michigan Ave., Chicago 28.
Riverton Lime & Stone Co., Inc., Riverton, Va.
Roan Mfg. Co., 1220 Washington Ave., Racine, Wis.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
Roberts-Gordon Appliance Corp., 137 Arthur St., Buffalo 7.
Roberts Tube Works, 2500 Military Ave., Detroit.
Robertson, F. L., 56 Rano St., Buffalo.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22.
Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N. J.
Robinson Insulation Co., P. O. Box 1419, Great Falls, Mont.
Rochester Lead Works, Inc., 380 Exchange St., Rochester 8, N. Y.
Rochester Mfg. Co., Brighton Station, Rochester 10, N. Y.
Rock Fleece Company, 115 Durango St., El Paso, Texas.
• Rock Island Register Co., 2425 Fifth Ave., Rock Island, Ill.
Rockwood Mfg. Co., 1801 English Ave., Indianapolis.
Roebling's Sons Co., John A., 640 S. Broad St., Trenton 2, N. J.
Roesch & Associates, Inc., 120 E. Washington St., Syracuse, N. Y.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg Sta., Pittsburgh 15.
Rogers Diesel & Aircraft Corporation, 1128 Leggett Ave., New York 59.
Rolock, Incorporated, 1344 Kings Highway East, Fairfield, Conn.
Roller Bearing Co. of America, Whitehead Rd., Trenton 3, N. J.
Rolyan Corp., 2241 Indiana Ave., Chicago 36.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Roper Corp., Geo. D., Blackhawk Park Ave., Rockford, Ill.
Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
Rosedale Foundry & Machine Co., Columbus Ave., N. S., Pittsburgh.
Ross Heater & Mfg. Co., Inc., 1407 West Ave., Buffalo.
Ross Sprinkler Co., 34 Roberts St., Pasadena 3, Calif.
Rotary Mfg. Co., 5718 Long Beach Ave., Los Angeles.
Roto-Beam Division, Peerless of America, Inc., 333 N. Michigan Ave., Chicago.
Round Oak Co., Dowagiac, Mich.
Roxalin Flexible Finishes, Inc., 800 Magnolia Ave., Elizabeth, N. J.
Royal Air Conditioning Equipment Co., 1024 Westminster Ave., Alhambra, Calif.
Royal-Apex Mfg. Corp., 62 Schenectady Ave., Brooklyn, N. Y.
Royal Ventilator Co., 415 Locust St., Philadelphia 6.
Royersford Foundry & Machine Co., 55 Main St., Royersford, Pa.
Ruberoid Co., The, 500 Fifth Ave., New York 18.
• Ruby Chemical Co., 74 McDowell St., Columbus 8, O.
• Rudy Furnace Co., Dowagiac, Mich.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12.
Ruggles-Klingemann Mfg. Co., 4 Foster Ct., Salem, Mass.
Ruppright, Siegfried, 299 S. Atlantic Blvd., Los Angeles 22.
Russell Electric Co., 342 W. Huron St., Chicago 10.
Russell Co., F. C., 1836 Euclid Ave., Cleveland.
Russell Mfg. Co., John M., Box 246, Naugatuck, Conn.
Rust Products Co. of America, 618 W. Adams St., Chicago.
Rusticide Products Co., 3125 Perkins Ave., Cleveland.
Rutland Fire Clay Co., 91 Curtis Ave., Rutland, Vt.
• Ryboit Heater Co., Miller St., Ashland, O.
• Ryerson & Son., Inc., Joseph T., 2558 W. 16th St., Chicago 80.
Ryniker Steel Products Company, 122-124 N. 25th St., Billings, Mont.

S

S K F Industries, Inc., Front St. and Erie Ave., Philadelphia 34.
Saftee Glass Co., Stenton Ave. & Louden St., Philadelphia 44.
Saino Mfg. Co., Inc., F. L., 70 W. Colorado Ave., Memphis, Tenn.
St. Charles Mfg. Co., St. Charles, Ill.
St. Clair Foundry Corp., Beech & Wilson Sts., Centralia, Ill.
St. Louis Furnace Mfg. Co., 2710 N. 25th St., St. Louis 6.
St. Louis Tool Co., 6100 Prescott St., St. Louis, 15.
St. Paul Corrugating Co., Wabasha & Water Sts., St. Paul 1, Minn.
• Sall Mountain Co., 176 W. Adams St., Chicago 3.
• Sampsell Time Control, Inc., 600 N. Strong Ave., Spring Valley, Ill.
Samson Plaster Board Co., Crosby Bldg., Buffalo.
Sandee Mfg. Co., 3945 N. Western Ave., Chicago.
Sandberg Co., H. J., 500 N. E. Union Ave., Portland 14, Ore.
Sanders, J. A., Successor to Van Praag Sales, Box 123, Fulton, N. Y.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Sanit-Air Products Company, 802 Tower Bldg., South Bend 3, Ind.
Sanmyer Corporation, 1265 W. North Ave., Chicago.
Sanvin Chemical Products Co., 1617 21st Ave., Moline, Ill.
Sarco Co., Inc., 475 Fifth Ave., New York 17.
Sarcotherm Controls, Inc., 222 North Bank Dr., Chicago 54.
Sauereisen Cements Co., Sharpsburg, Station, Pittsburgh 15.
Savage Co., W. J., 912 W. Clinch Ave., Knoxville 2, Tenn.
Saverite Engineering Co., 1031 Clinton St., Hoboken, N. J.
Sawyer Electrical Mfg. Co., 5701 Smithway, Los Angeles 22.
• Schaefer Brush Mfg. Co., 1025 S. Second St., Milwaukee 4.
Scaife Company, Oakmont, Pa.
Schatz Mfg. Co., Fairview, Poughkeepsie, N. Y.
Schecter Brothers Co., Hancock & Huntington Sts., Philadelphia 33.
Scheim Brothers, Inc., 201 Anna St., East Peoria 8, Ill.
Scherr Co., Inc., George, 128 Lafayette St., New York 13.
Schieren Co., Chas. A., 30-38 Ferry St., New York City.
Schill Mfg. Co., 302 Mansfield St., Crestline O.
Schmieg Industries, 312-320 Piquette Ave., Detroit 2.
Schneible Co., Claude B., 2827 25th St., Detroit 32.
Schoedinger, F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.
Schundler & Co., Inc., F. E., Insulation Div., 504 Railroad St., Joliet, Ill.
• Schwab Furnace Company, 193 S. Second St., Milwaukee 4.
• Schwab Safe Co., East Maine and Blvd., Lafayette, Ind.
• Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis 7.
• Sciaky Bros., 4915 W. 67th St., Chicago 38.
Scientific Instrument Co., 531-35 W. Larned St., Detroit 26.
Scott Engineering Co., 23 N. Sixth St., Noblesville, Ind.
Scott-Newcomb, Inc., 2106 Olive St., St. Louis 3.
Scoville Mfg. Co., Morency-Van Buren Div., Prairie Ave., Sturgis, Mich.
Sealkote Corp., 40 S. Clinton St., Chicago.
Seamlex Co., 27-27 Jackson Ave., Long Island City 1, N. Y.
Security Manufacturing Co., 1630 Oakland Ave., Kansas City 3, Mo.
Self-Vulcanizing Rubber Co., Inc., 605 W. Washington Blvd., Chicago.
Semco Mfg. Co., 118-122 Third Ave., N., Nashville, Tenn.
Seneca Wire & Mfg. Co., P. O. Box 71, Fostoria, O.
Sentry Mfg. Co., N. E. Cor. 13th & Grace Sts. Omaha, Nebr.
Servel, Inc., Electric Refrigeration Div., 119 Morton Ave., Evansville 20, Ind.
Service Machine Co., 158 Miller St., Elizabeth 4, N. J.
Service to Industry, Box 133, West Hartford, Conn.
Shafer Bearing Corp., 1412 W. Washington Blvd., Chicago 7.
Shakeproof, Inc., 2501 N. Keeler Ave., Chicago 39.
Shamblen Furnace Parts Co., 231-39 First Ave., Pittsburgh.
Sharon Steel Corp., Drawer 537, Sharon, Pa.
Shedlov Oil Burners, Inc., 717 Third Ave., S. Minneapolis 2.
Sheet Metal Mfg. Co., Inc., 953 Myrtle Ave., Brooklyn.
Sheet Metal Products Co., 320 S. Commercial St., Peoria 2, Ill.
Sheet Metal Specialty Company, 3rd & Liberty Ave., Pittsburgh.
Sheldon Slate Products Co., Inc., 5 N. Main St., Granville, N. Y.
Shellmar Products Co., 1132 S. Fair Oaks Ave., South Pasadena, Calif.
Shepard Niles Crane & Hoist Corporation, 410 Schuyler Ave., Montour Falls, N. Y.
Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1.
Shreveport Engineering Co., Inc., 1553-55 Texas Ave., Shreveport, La.
Sight Feed Generator Co., 14 N. Tenth St., Richmond, Ind.
Signal Electric Mfg. Co., P. O. Box 75, Menominee, Mich.
Silent Glow Oil Burner Corp., 1477 Park St., Hartford, Conn.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11.
Simplex Ceiling Co., 60 E. 42nd St., New York City 17.
Simplex Manufacturing Co., 200 North Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 11 Park Place, New York 7, N. Y.

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Sinker-Davis Co., 230 S. Missouri St., Indianapolis 4.
Sioux City Foundry and Boiler Co., East 8th & Division Sts., Sioux City, Iowa.
Sioux Steel Co., Sioux Falls, S. D.
Sipe & Company, James B., Box 8010, S. Hills Branch, Pittsburgh.
Sisalkraft Co., The, 205 W. Wacker Dr., Chicago 6.
Skilbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.
• Skilsaw, Inc., 5033 Elston Ave., Chicago 30.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., 1954 N. 9th St., St. Louis 6.
Skinner Irrigation Co., 1212 E. Canal St., Troy, O.
• Skuttle Manufacturing Co., 517 E. Larned St., Detroit 26.
Sleeth & Son, J. E., 910 N. Howard St., Spokane 11, Wash.
Sly Mfg. Co., W. W., 4736 Train Ave., Cleveland 2.
Small Motors, Inc., 1322 Elston Ave., Chicago.
Smidth & Co., F. L., 60 E. 42nd St., New York 17.
Smith Corporation, A. O., Milwaukee 1.
Smith Furnace Co., 216 S. Croton Ave., New Castle, Pa.
Smith Heater Co., Peter, 6209 Hamilton Ave., Detroit 2.
Smith & Kanzler Corp., 516 Lidgerwood Ave., Elizabeth 2, N. J.
Smith Manufacturing Co., Inc., F. A., P. O. Box 509, Rochester 2, N. Y.
Smith-Raymond Co., 1231-33 Tenth Ave., Columbus, Ga.
• Smith, R. E., 1513 Monroe St., Waukegan, Ill.
Smith Welding Equipment Corp., 2619-33 Fourth St., S. E., Minneapolis 14.
Smooth-on Mfg. Co., 568-574 Communipaw Ave., Jersey City 4, N. J.
Snap-On Mfg. Co., 1028 Blue Island Ave., Chicago.
Snap-On Tools Corporation, Kenosha, Wis.
Socony Paint Products, Div. of Socony-Vacuum Oil Co., Inc., 26 Broadway, New York City 4.
Solvay Sales Corp., 40 Rector St., New York 6.
Somers, Inc., H. J., 6063 Wabash Ave., Detroit 8.
Sonneborn Sons, Inc., L., 88 Lexington Ave., New York 16.
Sonner Burner Co., P. O. Box 903, Winfield, Kan.
Soss Manufacturing Co., 21777 Hoover Rd., Detroit 13.
Sound Equipment Corporation of California, 3903 San Fernando Rd., Glendale 4, Calif.
South Bend Air Products, Inc., 322 E. Colfax, South Bend, Ind.
Southbridge Roofing Co., Inc., Hartwell & Chapin Sts., Southbridge, Mass.
Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis 20.
Southern States Iron Roofing Co., Stiles Ave. & Louisville Rd., Savannah, Ga.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwest Manufacturing Co., 1615 E. First St., Santa Ana, Calif.
Spear Stove & Heater Co., James, 3430 Chestnut St., Philadelphia.
Specialty Converters, Inc., East Braintree, Mass.
Speedway Mfg. Co., 1854 S. 52nd Ave., Cicero 50, Ill.
Spencer Heater Division, The Aviation Corporation, 164 Park St., Williamsport, Pa.
Spencer Thermostat Co., Unit of Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
Spencer Turbine Co., 484 New Park Ave., Hartford 6, Conn.
Sperry & Co., D. R., Batavia, Ill.
Spiegel Corporation, G. B., 1901 S. Washtenaw Ave., Chicago 8.
Sponge Rubber Products Co., Shelton, Conn.
Sporlan Valve Co., 3723 Commonwealth Ave., St. Louis.
Spray Engineering Co., 103 Central St., Somerville 45, Mass.
Spraying Systems Co., 4021F W. Lake St., Chicago 24.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago.
Sprout-Waldron & Co., Muncy, Pa.
Spun Steel Corporation, 1201 Camden Ave., S. W., Canton 6, O.
Square D Co., 6060 Rivard St., Detroit 11.
Stafford Co., N., 117 53rd St., Brooklyn 32.
• Stainless & Steel Products Co., Certified Furnace Co. Div., 1000 Berry Ave., St. Paul 4.
Standard Asbestos Mfg. Co., 820-22 W. Lake St., Chicago 7.
Standard Engineering Works, 289 Roosevelt Ave., Pawtucket, R. I.
Standard Fuel Engineering Co., 667 Post Ave., South, Detroit 17.
Standard Furnace & Supply Co., 413-17 S. Tenth St., Omaha 8.
Standard Galvanizing Co., 2619 W. Van Buren St., Chicago.
Standard Heater & Oil Equipment Co., 245 Cornelison Ave., Jersey City 2, N. J.
Standard Heating Equipment Co., 516 Saxon St., Waterloo, Ia.
Standard Heating & Radiator Co., 532 First Ave. & Ross St., Pittsburgh 19.
Standard Lime & Stone Co., 2004 First National Bank Bldg., Baltimore 3.
Standard Machinery Company, Providence 7, R. I.
Standard Pressed Steel Co., Jenkintown, Pa.
Standard Rolling Mills, Inc., 143 Jewel St., Brooklyn 22.
Standard Stamping & Perforating Co., 3137 W. 49th Pl., Chicago.
Standard Steel Spring Co., 2640 E. Fifth Ave., Gary, Ind.
Standard Thermometer, Inc., 65 Shirley St., Boston 19.
Standard Ventilator Co., Lewisburg, Pa.
• Stanley Electric Tool Div., The Stanley Works, 131 Elm St., New Britain, Conn.
Stanley Tools, New Britain, Conn.
Stanton Heater Co., Martins Ferry, O.
Star Electric Motor Co., 197 Bloomfield Ave., Bloomfield, N. J.
Star Expansion Bolt Co., 147 Cedar St., New York City 6.
Starr Piano Co., Richmond, Ind.
Sta-Warm Electric Co., Ravenna, Ohio.
Steamaire Co., Dana Ave. & Newton St., Cincinnati, Ohio.
Steel Products Engineering Co., 1205 W. Columbia St., Springfield, O.
Steele & Tubes, Inc., Div. Republic Steel Corp., 200 E. 131st St., Cleveland 8.
Steffens-Amberg Co., 262 Morris Ave., Newark 3, N. J.
Steinhorst & Sons, Inc., Emil, 612 South St., Utica 3, N. Y.
Stephens-Adamson Mfg. Co., 55 Ridgeway Ave., Aurora, Ill.
Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22.
Sterling Foundry Co., Sterling, Ill.
Ster-Na-Man Fdry. Co., 441 Williams St., Springfield, Ill.
Stewart Foundry, O. S., 887 E. 67th St., Cleveland.
Stewart Ice Machine Co., 1046 East 22nd St., Los Angeles.
Stewart Manufacturing Co., 610 Bloomfield Ave., Bloomfield, N. J.
Stewart Company, W. H., P. O. Box 4, Oklahoma City 1, Okla.
Stewart-Rogers, Inc., 3915 Powelton Ave., Philadelphia 4.
Stiglitz Furnace & Foundry Co., 2007-23 Portland Ave., Louisville, Ky.
• Stok-A-Fire Co., Inc., 6504 Olive Street Road, University City 5, Mo.
Stoker-Lad Co., Division at I, Tacoma 3, Wash.
Stoker Products, Inc., 221 W. Prairie Ave., Decatur, Ill.
Stokerunit Corp., 4548 W. Mitchell St., Milwaukee 14.
Stokes, Jr., J. W., successor to American Coppercote, Inc., 189 Montague St., Brooklyn, N. Y.
• Stokol Stoker Co., Inc., 1145 E. 22nd St., Indianapolis 7, Ind.
Stortz & Son, Inc., John, 210 Vine St., Philadelphia 6.
Stossel & Sons, Carl, Front Royal, Va.
Stove Manufacturers Corporation, 182 Mulberry St., Newark, N.J.
Stow Manufacturing Co., 445 State St., Binghamton, N. Y.
Strandwitz & Co., Inc., W. J., Jefferson and Master St., Camden, N. J.
Stratton & Terstegge Co., 1501 W. Main St., Louisville 1.
Streamline Pipe & Fittings Div., Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.
Streine Tool & Mfg. Co., New Bremen, Ohio.
Structural Slate Co., Robinson Ave., Pen Argyl, Pa.
Struthers-Dunn, Inc., 1321 Arch St., Philadelphia 7, Pa.
Sturtevant Co., B. F., Div. Westinghouse Electric, Damon St., Hyde Park, Boston 36.
Sundstrand Engineering Co., 1327 Seventh St., Rockford, Ill.
Sundstrand Pump Division, 2530 Eleventh St., Rockford, Ill.
Sun-Fire Stoker Corporation, New Albany, Ind.
Super Radiator Corp., 652 Stinson Blvd., Minneapolis 13.
Superior Flux Co., 913 Public Square Bldg., Cleveland 13.
Superior Manufacturing Co., Public Sq. Bldg., Cleveland 13.
Superior Manufacturing Co., Alexandria, Ind.
Superior Products Co., 606 S. 14th St., Omaha 2, Nebr.
Superior Sheet Steel Co., The, Division of Continental Steel Corp., Canton & Louisville Rd., Canton 1, O.
Superior Safety Furnace Pipe Co., 5820 Forsythe Ave., Detroit 2.
Superior Steel Corp., Grant Bldg., Pittsburgh.
Supreme Air Filter Co., 126 W. 21st St., New York City.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Sure Comfort Furnace Co., 900 Des Plaines Ave., Forest Park, Ill.
• Surface Combustion Corporation, 2375 Dorr St., Toledo 1, O.
Swaby Mfg. Co., 2330 W. Cermak Rd., Chicago 8.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6.
• Swartwout Co., 18615 Euclid Ave., Cleveland 12.
Swift Electric Welder Co., 6560 Epworth Blvd., Detroit 10.
Swift Mfg. Company, 247 McDougall Ave., Detroit.
Syncro-Flame Burner Corp., 966 Main St., Brockton 64, Mass.
• Syncromatic Corporation, 5110 N. 35th St., Milwaukee 9, Wis.
Synchro-Start Products, 221 E. Cullerton St., Chicago 16.
Syntron Co., Homer City, Pa.
Syracuse Fire Door Corp., 900 Canal St., Syracuse, N. Y.

T

Tagliabue Div., C. J., Portable Products Corp., Park & Nostrand Aves., Brooklyn 5.
Tamms Silica Co., 228 N. LaSalle St., Chicago 1.
Tannewitz Works, 315 Front Ave., N. W., Grand Rapids 4, Mich.
Taylor Engineering Co., Metropole Hotel, Cincinnati.
Taylor-Hall Welding Corp., Box 311, Warren, Ohio.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor Sons Co., Charles, 715 Burns St., Cincinnati 14.
Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
Technical Processes Div., Colonial Alloys Company, Ridge Ave. & Crawford St., Philadelphia 29.
Tecumseh Products Co., Tecumseh, Mich.
Telsit Insulation Co., 1923 West Farms Road, Bronx, N. Y.
• Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham 2, Ala.
Tennessee Enamel Mfg. Co., 4104 Park Ave., Nashville 9, Tenn.
Tennessee Products Corp., American Natl. Bk. Bldg., Nashville, Tenn.
Thatcher Furnace Company, Centre St., Garwood, N. J.
Thermal Industries, Indio, Calif.

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Therminsul Corp., 1603 Fulford St., Kalamazoo, Mich.
Thermoid Rubber Div. of Thermoid Co., Whitehead Rd., Trenton 6, N. J.
Thomas Machine Manufacturing Co., Etna Branch P. O., Pittsburgh 23.
Thompson & Company, 1035 Allegheny Ave., Oakmont (Pittsburgh Dist.), Pa.
Thomson-Gibb Electric Welding Co., 161 Pleasant St., Lynn, Mass.
ThruBond Flashing Corp., 1204 Washington Ave., New York City.
Thrush & Company, H. A., Peru, Ind.
Tierney Rotor Ventilator Co., 239 4th Ave., S., Minneapolis.
Tiffin Art Metal Co., Tiffin, Ohio.
Tiffin Eaves Trough Clamp Co., 25 Miami St., Tiffin, Ohio.
Timken Roller Bearing Co., 1835 Dueber Ave., S. W., Canton 6, Ohio.
Timken Silent Automatic Div., Timken-Detroit Axle Co., 100 Clark Ave., Detroit 32.
Timm & Son, P. C., 2626 C St., Lincoln, Nebr.
Tinit Manufacturing Co., Inc., P. O. Box 794, Denver 1, Colo.
Tinnerman Products, Inc., 2065 Fulton Rd., Cleveland 13.
Tishken Products, Livernois & Van Buren Sts., Detroit, Mich.
Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, O.
Toch Brothers, Inc., 2600 Richmond Ter., Elm Park, S. I., N. Y.
Todd Shipyards Corporation (Combustion Eq. Div.), 601 W. 26th St., New York 1.
Topflight Tool Co., Huber Building, York 4, Pa.
Torchweld Equipment Div., National Cylinder Gas Co., 1035 W. Lake St., Chicago.
Torit Manufacturing Co., 292 Walnut St., St. Paul 2.
Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Torrington Co., Field St., Torrington, Conn.
Torrington Mfg. Co., 70 Franklin St., Torrington, Conn.
Townsend Co., New Brighton, Pa.
Trade-Wind Motorfans, Inc., 5725 S. Main St., Los Angeles 37.
Trane Co., The, La Crosse, Wis.
Tremont Nail Company, Box 111, Wareham, Mass.
Trerice Co., H. O., 1420 W. Lafayette Blvd., Detroit 16.
• Triangle Manufacturing Co., 388 Division St., Oshkosh, Wis.
Trimount Rotary Power Co., 396 Whiting Ave., P. O. Box 65, East Dedham, Mass.
Trindl Products, Ltd., 17 E. 23rd St., Chicago 16.
Triplex Mfg. Co., Peru, Ind.
Tri-State Heating Supply Co., 234-236 Murray St., Fort Wayne 5, Ind.
Tropic-Air Stoker Co., 2017 Indiana Way, N. E., Canton 5, O.
Tropical Paint & Oil Co., 1244-86 W. 70th St., Cleveland.
Trumbull Electric Mfg. Co., Woodford Ave., Plainville, Conn.
Trufio Fan Co., 523 Main St., Harmony, Pa.
Tru-Mac Mfg. Co., 24 Woburn St., Reading, Mass.
Truscon Laboratories, Caniff & Grand Trunk R. R., Detroit 11.
Truscon Steel Co., Albert St., Youngstown 1, O.
Tubular Rivet & Stud Co., Wollaston 70, Mass.
Turco Products, Inc., 6135 S. Central Ave., Los Angeles 54.
Turner & Seymour Mfg. Co., Lawton St., Torrington, Conn.
Turner Brass Works, 821 Park Ave., Sycamore, Ill.
Tuthill Pump Company, 939 E. 95th St., Chicago 19.
• Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.
Tweco Products Company, English at Ida, Wichita 7, Kan.
Twentieth Century Heating & Ventilating Co., 96 Ira Ave., Akron 1, Ohio.

U

Uehling Instrument Co., 473 Getty Ave., Paterson 3, N. J.
Una Welding, Inc., 1615 Collamer Ave., Cleveland 10.
Unified Air Conditioner Co., 322 W. Michigan St., Duluth, Minn.
Uniflow Mfg. Co., East Lake Road, Erie, Pa.
U-Ni-Matic Heating Systems, Inc., 1303 W. Slauson Ave., Los Angeles 44.
Union Mfg. Co., 297 Chestnut St., New Britain, Conn.
• Union Manufacturing Co., Inc., 6th & Washington Sts., Boyertown, Pa.
Union Steam Pump Co., S. W. Capital Avenue, Battle Creek, Mich.
Unique Manufacturing Co., Inc., 218 W. Walton St., Chicago 10.
United Chromium, Incorporated, 51 E. 42nd St., New York City 17.
United Cork Companies, Central Ave. & N. J. Central R. R., Kearny, N. J.
United Electric Controls Co., 69 "A" St., South Boston 27.
United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City 1, N. Y.
United Metal Prod. Div., Canton, Ohio.
• U. S. Air Conditioning Corp., 2101 Kennedy St., N. E., Minneapolis 13.
United States Brass & Copper Co., Hyde Park Ave., Hyde Park, Mass.
United States Burner Corp., River Road, Wethersfield, Conn.
U. S. Cistern Filter Mfg. Co., The, 509 S. McClun St., Bloomington, Ill.
U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54.
United States Electrical Tool Co., 1050 Findlay St., Cincinnati 14
U. S. Expansion Bolt Co., Inc., P. O. Box 827, York, Pa.
U. S. Gutta Percha Paint Company, 35 Dudley St., Providence 1, R. I.
United States Gauge Co., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6.
• U. S. Machine Corporation, Lebanon, Ind.
United States Mineral Wool Co., 10 S. LaSalle St., Chicago 3.
United States Ozone Co. of America, Crescent St., Scottsdale, Pa.
United States Radiator Corp., 1500 United Artists Bldg., Detroit 31.
• United States Register Co., Burnham St., Battle Creek, Mich.
U. S. Rock Wool Co., 40 S. Main, Salt Lake City 1.
United States Rubber Co., 1230 Sixth Ave., New York 20.
• United States Steel Corp., 436 Seventh Ave., Pittsburgh, 30.
U. S. Stoneware Company, Akron, Ohio and 60 E. 42nd St., New York City 17.
Universal Air Filter Corp., 332 W. Michigan St., Duluth 2, Minn.
Universal Blower Co., 1090 S. Adams Ave., Birmingham, Mich.
Universal Cooler Corp., 299 Joseph St., Marion, Ohio.
Universal-Cyclops Steel Corp., Bridgeville, Pa.
Universal Gypsum & Lime Co., 111 W. Washington St., Chicago.
Universal Manufacturers, Inc., Midland Park, N. J.
Universal Power Corporation, 715 Carnegie Ave., Cleveland 15.
Universal Zonolite Insulation Co., 135 S. LaSalle St., Chicago 3.
Uno Ventilator Co., 565 Lincoln Ave., Cliftondale Station, Saugus, Mass.
Utica Products, Incorporated, Utica 4, N. Y.
Utility Appliance Corporation, 4851 S. Alameda St., Los Angeles 11.

V

Vacuum Gas Burner Corp., 115 N. Union St., Olean, N. Y.
Vail Mfg. Co., 1017 Columbia Ave., Fort Wayne, Ind.
Valley Mfg. Co., Fryeville, Athol, Mass.
Van Dorn Electric Tool Co., Towson 4, Md.
Van Noorden Co., E., 100 Magazine St., Boston 19.
Vapor Car Heating Co., Inc., 80 E. Jackson Blvd., Chicago.
Vendor Slate Co., Inc., P. O. Box 204, Nazareth, Pa.
Ventilating Products Co., 2800 Cottage Grove Ave., Chicago.
Vent-O-Lite Co., 4230 W. Taylor St., Chicago 24.
Vermont Structural Slate Co., Inc., P. O. Box 98, Fair Haven, Vt.
• Verson Allsteel Press Co., 1351 E. 93rd St., Chicago 19.
Vibration Eliminator Co., 10-28 47th Ave., Long Island City 1, N. Y.
Vibration Control Company, 521 Fifth Ave., New York City.
Victor Electric Products, Inc., 2950 Robertson Road, Cincinnati 9.
Victor Equipment Co., 844 Folsom St., San Francisco 7.
Victor Oil Burner Mfg. Co., 250 Pleasant St., Hartford 3, Conn.
Victory Mfg. Co., Plastics Dev., Div., 1105 Fair Oaks Ave., South Pasadena, Calif.
• Viking Air Conditioning Corp., 5600 Walworth Ave., Cleveland 2.
Victory Mfg. Co., Plastics Dev. Div., 1105 Fair Oaks Ave.,
Viking Pump Co., 410 State St., Cedar Falls 1, Ia.
Viking Shear Co., 1063 W. 19th St., Erie, Pa.
Viliter Mfg. Co., 2217 S. First St., Milwaukee 7.
Virginia Rubatex Div., Great American Industries, Inc., Bedford, Pa.
Vita-Screen Ventilator Co., 103 Park Ave., New York City.
Volcano Burner Corp., 3612 E. Tremont Ave., New York City.
Voss Co., J. H. H., 785 E. 144th St., Cor. Wales Ave., New York City 54.
Vulcan Electric Co., Div. Consolidated Electric Lamp Co., Inc., 88 Holten St., Danvers, Mass.

W

Wade Manufacturing Co., 77 N. State St., Elgin, Ill.
Wagner Electric Corp., 6440 Plymouth Ave., St. Louis 14.
Wailes Dove-Hermiston Corp., Westfield, N. J.
Waldron Corp., P. O. Box 110, John, New Brunswick, N. J.
Wales-Strippit Corporation, 345 Payne Ave., North Tonawanda, N. Y.
• Walker Mfg. & Sales Corp., 1711-1717 Penn St., St. Joseph 1, Mo.
Wall Chemicals Div., Liquid Carbonic Corp., 625 W. Jackson Blvd., Chicago 6.
Wall Mfg. Supply Company, P., 3126 Preble Ave., N. S., Pittsburgh 12.
Walsh Refractories Corp., 4070 N. First St., St. Louis 7.
Ward Co., Edgar T., Inc., 7777 W. Lake St., River Forest, Ill.
Ward Co., H. H., Chester, Pa.
Ward Heater Co., 1800 W. Washington Blvd., Los Angeles.
Ward Leonard Electric Co., 37 South St., Mt. Vernon, N. Y.
Ward Machinery Co., 564 W. Washington Blvd., Chicago.
Ward Mfg. Co., Plymouth, Mich.
Warner Bros. Co., Bridgeport 2, Conn.
Warren Handle Works Co., 1100 Pearl St., Cortland, Ohio.
Washburne & Co., E. G., 207 Fulton St., New York City.
Washington Stove Works, 3402 Smith St., Everett, Wash.
• Waterloo Register Co., 600 Anite St., Waterloo, Ia.
Water Cooling Corporation, 71 Nassau St., New York City 7.
Water Cooling Equipment Corp., New Hampshire Ave. & Weber Rd., Affton Sta., St. Louis 23.

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• Waterman-Waterbury Co., 1122 Jackson St., N. E., Minneapolis 13.
Wattenamel Co., 7400 Archer Ave., Summit, Ill.
Waukesha Lime & Stone Co., P. O. Box 27, Waukesha, Wis.
Waverly Heating Supply Co., 31 Union St., Boston 8.
Wayne Automatic Relay Co., 622 Wagner St., Fort Wayne, Ind.
Wayne Oil Burner Company, 800 Glasgow Ave., Fort Wayne 4, Ind.
Weatherall Engineers, Inc., 3 Friendship St., Providence 3, R. I.
Weaver Mfg. Co., Heating Plant Div., Springfield, Ill.
Webb Co., Jervis B., Joy Rd. & Alpina Ave., Detroit.
Webster Electric Co., DeKoven & Clark Sts., Racine, Wis.
Webster Engineering Co., 419 W. 2nd St., Tulsa, Okla.
Weil Pump Co., 1538 N. Fremont St., Chicago 22.
Weinman Pump Mfg. Co., 290 Spruce St., Columbus 8, O.
• Weirton Steel Co., Weirton, W. Va.
Weiss & Co., H., 113-115 Mercer St., New York City.
Weksler Thermometer Corp., 52-54 W. Houston St., New York 12.
Weldex, Inc., 7326 McDonald Ave., Detroit 10.
Welding Apparatus Co., 2750 W. Van Buren St., Chicago.
Welding Machines Manufacturing Company, 17325 Lamont St., Detroit 12.
• Wells Mfg. Corp., 315 Seventh Ave., Three Rivers, Mich.
Werner Co., Inc., R. D., 295 Fifth Ave., New York 16.
Western Air Devices, 1349 E. Vernon Ave., Los Angeles 11.
Western Blower Co., 1800 Airport Way, Seattle 4, Wash.
Western Brass Mill Div., Olin Industries, Inc., East Alton, Ill.
Western Engineering & Mfg. Co., 1726 E. Washington Blvd., Los Angeles 21.
Western Felt Works, 4027 Ogden Ave., Chicago 23.
Western Furnaces, Inc., 950 Commerce St., Tacoma 2, Wash.
Western Mineral Products Co., 2602 Ed Creighton Ave., Omaha 1, Nebr.
Western Precipitation Corp., 1016 W. 9th St., Los Angeles 15.
Western Reserve Laboratories, 1440 W. Third St., Cleveland 13.
Western Rock Wool Corp., P. O. Box 545, Huntington, Ind.
Western Silicair Products, Inc., 72 W. Alameda Ave., Burbank, Calif.
Western Wire & Iron Works, Inc., 957 W. 18th Pl., Chicago 8.
Westinghouse Electric Corporation, East Pittsburgh 30 and Cleveland.
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J.
Westwick & Son, Inc., John, Claude & Meeker Sts., Galena, Ill.
West Wind Corporation, 1800 Airport Way, Seattle 4.
Wheelco Instruments Co., 847 W. Harrison St., Chicago 7.
Wheeler, Inc., W. H., 234 E. 46th St., New York 17.
Wheeling Corrugating Co., Wheeling Steel Bldg., Wheeling, W. Va.
• Wheeling Furnace Corporation, Martins Ferry, Ohio.
Wheeling Steel Corp., Wheeling Steel Bldg., Wheeling, W. Va.
• White Mfg. Co., 2362 University Ave., St. Paul, Minn.
• White-Rodgers Electric Co., 1209 Cass Ave., St. Louis 6.
• Whiting Corporation, 157 St. & Lathrop Ave., Harvey, Ill.
Whiting Stoker Sales Co., 11 S. LaSalle St., Chicago 3.
Whitlock Mfg. Co., 100 South St., Hartford 1, Conn.
Whitney Chain & Mfg. Co., 237 Hamilton St., Hartford 2, Conn.
• Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.
• Whitney Metal Tool Co., 91 Forbes St., Rockford, Ill.
Whitty Company, Inc., 86 Western Ave., Boston 34.
Wickwire Spencer Steel Co., 500 Fifth Ave., New York City 18.
Wiedemann Machine Co., 1815 Sedgley Ave., Philadelphia 32.
Wilbur & Williams Co., 1036 Park Sq. Bldg., Boston 16.
Wilder Mfg. Co., 2300 S. Main St., Niles, Ohio.
Wilhelm Co., A., Div. The Glidden Co., 3rd & Bern Sts., Reading, Pa.
Will-Burt Co., Orrville, O.
• Williams Oil-O-Matic Div., Eureka Vacuum Cleaner Co., 1201 E. Bell, Bloomington, Ill.
• Williams-Wallace Co., 160 Hooper St., San Francisco 7.
• Williamson Heater Co., 2558 Marburg Ave., Cincinnati 9, Ohio.
• Willis Steel Corporation, 156 N. Academy St., Galesburg, Ill.
Willson Products, Inc., 248 Thorn St., Reading, Pa.
Will-Weld Mfg. Co., Inc., 600 S. 15th St., Omaha 2, Nebr.
Willy's Carbide Tool Company, 1340 W. Vernor Highway, Detroit.
Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago 9.
Wilson Co., The H. A., 105 Chestnut St., Newark.
• Wilson, Inc., Grant, 141 W. Jackson Blvd., Chicago 4.
Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.
Wilster, Inc., 5700 Detroit Ave., Cleveland 2.
Wind-Way Fan & Ventilator Co., Inc., 527 St. Joseph St., New Orleans.
Wing Mfg. Co., L. J., 154 W. 14th St., New York 11, N. Y.
Winkler & Sons, Inc., A. E., 2337 N. 31st St., Milwaukee 10.
Wire & Iron Products, Inc., 842 Cherry St., Detroit 1.
Wiremold Company, Railroad Ave., Hartford 10, Conn.
• Wise Furnace Co., 101 Lincoln St., Akron 8, O.
• Wiss & Sons Co., J., 11-45 Littleton Ave., Newark 7.
Wittenmeier Machinery Co., 850 N. Spaulding Ave., Chicago 51.
• Wodack Electric Tool Corp., 4627 W. Huron St., Chicago 44.
Wolfe-Kote Co., 705 Center Ave., Sheboygan, Wis.
Wolff and Company, Benjamin, 58th St. at Seeley Ave., Chicago.
Wolverine Tube Div. Calumet and Hecla Consolidated Copper Co., 1419 Central Ave., Detroit 9.
Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.
• Wood Industries, Inc., Gar, 7924 Riopelle St., Detroit 11.
Wood Steel Co., Alan, P. O. Box 112, Conshohocken, Pa.
Woodhill Chemical Co., 3708 E. 93rd St., Cleveland.
Wood's Sons Co., T. B., 1275 Fifth Ave., Chambersburg, Pa.
Woolley Engineering Co., 412 Curtis Bldg., Detroit 2.
Woolwine Metal Products Co., Atlantic Blvd. & S. Riverside Dr., Los Angeles.
Worcester Brush & Scraper Co., Div. Mason Worcester Co., 38 Austin St., Worcester 2, Mass.
Worcester Pressed Steel Co., 99 Barber Ave., Worcester 6, Mass.
Worthington Pump & Machinery Corp., Harrison, N. J.
Wright Manufacturing Division, American Chain & Cable Company, Inc., Bridgeport, Conn.
Wyoming Stoker Worm Co., 58 E. Eighth St., Wyoming, Pa.
Wysong and Miles, 625 Fulton St., Greensboro, N. C.

X

XL Refrigerating Co., Inc., 1834 W. 59th St., Chicago.
X-Pando Corp., 43-15 36th St., Long Island City 1, N. Y.
XXth Century Heating & Ventilating Co., 96 Ira Ave., Akron, O.

Y

Yale & Towne Mfg. Co., Philadelphia Div., 4531 Tacony St., Philadelphia.
Yardley Plastics Company, 142 Parsons Ave., Columbus 15, O.
Yardley Venetian Blind Co., 138 Parsons Ave., Columbus 15, O.
Yarnall-Waring Company, Chestnut Hill, Philadelphia 18.
Yeomans Bros. Co., 1433 Dayton St., Chicago 22.
Yoder Co., 5500 Walworth Ave., Cleveland 2.
York Corrugating Co., Adams St. & WM RR., York, Pa.
York Corp., Roosevelt Ave., York, Pa.
York Electric Tool Co., 52 S. Duke St., York, Pa.
York-Heat Div. York-Shipley, Inc., Jessop Place and P. R. R., York, Pa.
York Electric and Machine Company, 1241 W. King St., York, Pa.
Young & Bertke Co., 1004-1014 Hulbert Ave., Cincinnati 14.
Young Radiator Co., 709 Marquette St., Racine, Wis.
Young Regulator Co., 4500 Euclid Ave., Cleveland.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O.

Z

Zallas Brothers & Johnson, Taylor and Locust Sts., Wilmington 99, Dela.
Zapon Div. Atlas Powder Co., North Chicago, Ill.
Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark 5.
Zenith Electric Company, 152 W. Walton St., Chicago 10.
• Zink Co., John, 4401 S. Peoria St., Tulsa 1, Okla.

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